EPA/AMD/R08-00/533
2000

EPA Superfund
Record of Decision Amendment:

OGDEN DEFENSE DEPOT (DLA)
EPA ID: UT9210020922
OU 04
OGDEN, UT
08/09/2000

Defense Distribution Depot Hill, Utah—Ogden Site

Final
Operable Unit 4 Hotspot

Record of Decision — Amendment for Operable Unit 4

Prepared for the

U.S. Army Corps of Engineers

June 2000

MONTGOMERY WATSON

U.S. Army Corps of Engineers
Sacramento District

257557

DEFENSE LOGISTICS AGENCY
DEFENSE DISTRIBUTION DEPOT HILL
5851 F AVENUE, BUILDING 849
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DDHU-D

June 26, 2000

TO: Ms. Judith McCulley
EPA Region VIII
Denver Place, Suite 500
999 18th Street
Denver, CO 80202-2466

SUBJECT: Final Operable Unit 4 Record of Decision Amendment

Dear Ms. McCulley,

Enclosed are two copies of the above mentioned document for you r use and review. Comments received from your office have been addressed in the document. We are not anticipating any further comments from your office on this document at this time.

If you need any further information please contact me at 399-7629.

Ronald G. Smith
RONALD G. SMITH
IRP Program Manager

Enclosure
Cc: Muhammad Slam, UDEQ

DEFENSE DISTRIBUTION DEPOT HILL, UTAH - OGDEN SITE

I OPERABLE UNIT 4
RECORD OF DECISION AMENDMENT AND
REQUEST FOR COMMENTS

RESPONSE TO COMMENTS

Reviewer: U. S. Environmental Protection Agency - Region VIII

OU 4 ROD Amendment

Comment 1 Section 4.2 the last sentence on the first page replace with the following. Although the soils will not be removed the excess cancer risk of 10 to the minus 6 will be met _ by elimination of direct contact.

Response: Agreed, the text has been modified as requested.

Request for Comments Regarding an Amendment to the Operable Unit 4 Record of Decision

Comment 1 Page 3 under Alternative 3 first sentence, it appears the word liquid should be replaced with would.

Response: Agreed, the text has been modified as requested.

Comment 2 Page 11 after "DDHU will place a covenant and deed restriction of the property future use of the buildings." Remove every thing to the glossary. Then check the wording on the first part of the sentence it does not seem clear what we are saying.

Response: The text has been deleted. Once the language from the deed restriction was removed, the first sentence was no longer appropriate, therefore all text was deleted.

DEFENSE DISTRIBUTION DEPOT HILL, UTAH
OGDEN SITE 1

FINAL
RECORD OF DECISION - AMENDMENT
FOR
OPERABLE UNIT 4

JUNE 2000

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TABLE OF CONTENTS

Table Of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ARAR	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cis-1,2-DCE	cis-1,2-dichlorethene
DDHU	Defense Distribution Depot Hill, Utah
DLA	Defense Logistics Agency
DOT	Department of Transportation
EE/CA	engineering evaluation and cost analysis
GAC	granular activated carbon
MCL	maximum contaminant level
ORC™	Oxygen Releasing Compound
OSHA	Occupational Safety and Health Administration
OU 4	Operable Unit 4
PCE	Tetrachloroethene
POTW	publicly owned treatment works
RAOs	remedial action objectives.
RCRA	Resource Conservation and Recovery Act
ROD	Final Record of Decision
SARA	Superfund Amendment and Reauthorization Act of 1986
SVOCs	semi-volatile organic compound
TCE	Trichloroethene
TCLP	toxicity characteristic leaching potential
TPH	total petroleum hydrocarbons
UDEQ	Utah Department of Environmental Quality
USEPA	U. S. Environmental Protection Agency
VOCS	volatile organic compound

RECORD OF DECISION AMENDMENT

1.0 INTRODUCTION

In September 1992, the Final Record of Decision (ROD) was signed, documenting the cleanup plan for Operable Unit 4, (OU 4) for Defense Distribution Depot, Ogden, Utah. Since the Depot closed in September 1997, portions of the facility remaining under Government control has been redesignated Defense Distribution Depot Hill, Utah (DDHU) - Ogden site. Therefore, all reference to the depot shall be made using DDHU. DDHU is located at 1200 South Street and 500 West in the City of Ogden, Weber County, Utah. Additional information regarding site descriptions can be found in the OU4 ROD. The lead agency for this ROD-Amendment is the Defense Logistics Agency (DLA). The supporting agencies include the U. S. Environmental Protection Agency - Region VIII (USEPA) and the Utah Department of Environmental Quality (UDEQ).

This ROD Amendment is intended to memorialize actions taken by the Defense Logistics Agency to respond to new areas of contamination discovered while implementing the OU 4 ROD.

1.1 STATEMENT OF PURPOSE

As required under Section 117 (c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA), and pursuant to 40 CFR Section 300.435(c)(2)(i) (Federal Register Volume 55, No. 46, [March 8, 1990]) this ROD - Amendment describes fundamental changes to the original OU 4 ROD to include specific remedial actions and goals to address a localized hotspot within OU 4 which was discovered during the implementation of the ROD. This OU 4 Hotspot consists of contaminated soils (from an oil pit and former disposal trenches) located under and between Buildings 359 (15C) and 367 (16C), and a ground-water contaminant plume. A ROD Amendment is required when fundamental changes are made to the final Remedial Action Plan described in the ROD. Further, this ROD Amendment describes information developed during the remedial design process that supports the subject change. It should be noted that the remedial activities at the OU 4 Hotspot were implemented quickly, before the ROD Amendment was in place, to prevent contaminated ground water from migrating off site. In addition, DDHU is in the process of transferring property and it was preferable for the remedial actions to have been constructed and operating properly and successfully before any transfer of property takes place.

This ROD Amendment includes a brief background of the DDHU OU 4 site, a summary of the remedy selected in the ROD, a description of how the noted change affects the remedy described in the ROD, and an explanation of why DDHU is making this change to the selected remedy. This document is designed to (1) provide the public with an explanation of the change made to the remedy in the ROD, (2) summarize the information that led to the change, (3) affirm that the revised remedy complies with the statutory requirements of CERCLA Section 121, and (4) solicit comments from the public.

In accordance with 40 CFR Section 300.825 (a)(2), this ROD Amendment, public comments and their associated responses, and other supporting documentation will be included in the Administrative Record which is located in the DDHU Environmental Library located at 375 South Ward Street, Ogden, Utah. For an appointment to view the Record contact the DDHU Environmental Office at 801-399-7848 or 801-399-7629.

2.0 SITE HISTORY, CONTAMINATION AND SELECTED REMEDY

This section provides a brief description and history of the DDHU site, chemicals of concern, and a summary of the remedy selected in the ROD. Further details can be found in the following documents located in the administrative record:

- *Draft Final Remedial Investigation/ Feasibility Study for Operable Unit 4 (James M. Montgomery, 1991)*
- *Final Record of Decision and Responsiveness Summary for Operable Unit 4 (Montgomery Watson, 1992)*
- *Revised Final Investigation and Alternative Analysis Report (Montgomery Watson, 1996)*
- *Final Operable Unit 4 Hotspot Design Concept for the OU 4 Hotspot Ground-water Remediation System (Montgomery Watson, 1997a)*
- *Final OU 4 Hotspot Exploration Trench Report (Montgomery Watson, 1997b)*
- *Final Operable Unit 4 Hotspot Investigation and Alternatives Analysis Report, Source Area Addendum (Montgomery Watson, 1997c).*

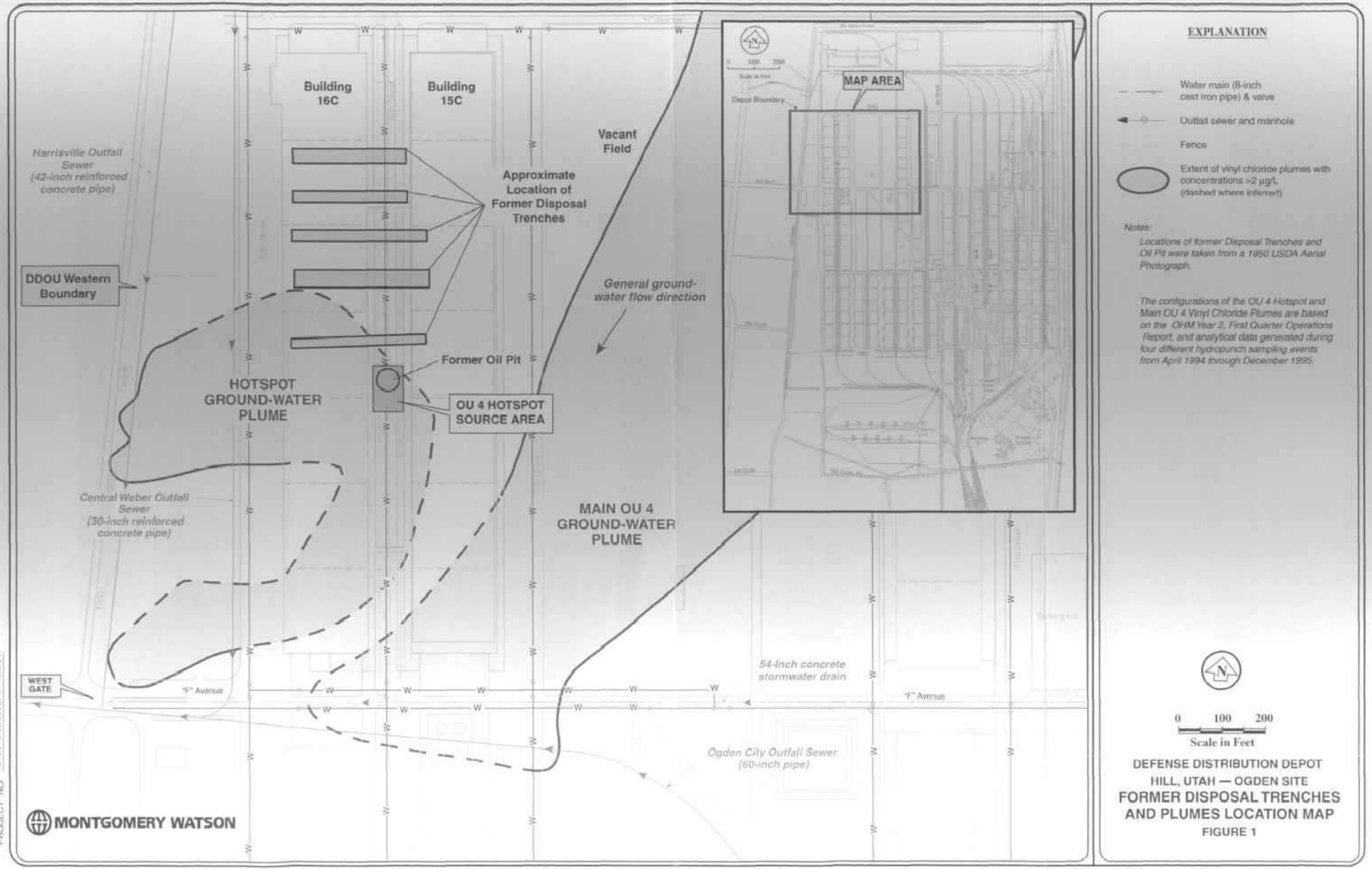
2.1 SITE DESCRIPTION AND HISTORY

DDHU is located in Weber County at 500 West 12th Street, Ogden Utah in a semi-rural setting. DDHU covers 1,100 acres within the Great Salt Lake Valley. Mill and Four Mile Creeks drain the topographically flat area of the installation and flow from east to west. The site is underlain by an unused shallow water table aquifer which is classified by the State of Utah as a Class II Aquifer, a potential future drinking water source, and a deeper, confined aquifer encountered at depths of 110 to 125 feet below ground surface. Operable Unit 4 is composed of waste disposal burial sites referred to as Burial Sites 4A through 4E. These sites are the source of ground-water contamination at OU 4 and are the subject of the remedy selected in the OU 4 ROD.

During the installation of the OU 4 ground- water treatment system, vinyl chloride contamination was detected at some of the proposed injection well locations that were previously believed to be free of subsurface contamination. Evidence of localized soil contamination was found between Buildings 15C (359) and 16C (367), which have likely resulted in the observed ground- water contamination in the immediate vicinity. The sources of contamination have been identified as former disposal trenches and an Oil Pit. The area is subsequently referred to as the OU 4 Hotspot, and its remediation is the subject of this ROD Amendment.

OU 4 Hotspot ground-water contaminant plume boundaries were identified through four phases of investigations conducted from April 1994 through December 1995 and are defined by vinyl chloride concentrations in ground water greater than 2 micrograms per liter (ug/l) on Figure 1. Exploration trench investigations conducted in October 1996 characterized soil contamination in the former disposal areas which identified:

- Metals (most notably lead) contamination in Disposal areas A and B,
- Low concentration volatile and semi-volatile organics (VOCs and SVOCs) in Disposal areas B, C and the Oil Pit,
- One chlorinated pesticide (4,4-DDD) in Disposal area C and the Oil Pit,
- Petroleum hydrocarbons in Disposal area B and the Oil Pit, and



MONTGOMERY WATSON

PROJECT NO. 12/2018.02/05/076 4/22/99

DEFENSE DISTRIBUTION DEPOT
HILL, UTAH — OGDEN SITE
FORMER DISPOSAL TRENCHES AND PLUMES LOCATION MAP
FIGURE 1

- Dioxins and furans.

Chemicals of concern, predominantly petroleum hydrocarbons present within the Oil Pit have migrated into the shallow aquifer and represent a continuing source of ground-water contamination. Lead concentrations in the former disposal area soils pose a potential risk to future construction workers at the site. No contaminants have been detected in groundwater sampled from monitoring wells in the deep aquifer. Risk assessment of the findings of investigative work in the source area was conducted and documented in the Final OU 4 Hotspot Exploration Trench Report, April 1997. Risk drivers were identified as lead in trenches A and B, and petroleum hydrocarbons in the soils and ground water. Of the detected contaminants, the low level VOCs and SVOCs, 4,4-DDD, and 2,3,7,8-TCDD were not found to pose a risk relative to the OU 4 Hotspot contamination, and are therefore not identified for remediation..

2.2 REMEDIES SELECTED IN THE ROD

The ROD for OU 4 addresses remedial activities for both soil and ground water. Under the ROD, soil and debris shall be excavated and transported offsite for disposal. Shallow ground water shall be treated on site using air stripping and granular activated carbon treatment (if necessary).

Specifically, under the selected remedy, the following actions were conducted (remedial actions that have been completed are indicated in italics):

1) Contaminated soil in Burial Sites 4-A and 4-E shall be excavated, tested using toxicity characteristic leaching potential (TCLP) methods and for F001 through F005 status, and placed in an offsite Resource Conservation and Recovery Act (RCRA) hazardous waste landfill. Soils failing F001 through F005 criteria shall be treated by the receiving facility using compliant stabilization/ fixation methods. Material failing land disposal criteria for dioxins shall be transported to a commercial incineration facility for thermal treatment.

   Soil removal activities were initiated in November 1993 and were completed in July 1994. Approximately 9,300 cubic yards of contaminated soil and debris were excavated and disposed of in a RCRA-permitted Subtitle C landfill facility in accordance with the ROD.

2) Water purification tablets from Burial Site 4-D shall be placed in an off site RCRA industrial waste landfill.

   Large quantities of glass bottles containing water purification tablets were encountered during the excavation of Burial Site 4- D. Due to the presence of free water, the bottles were separated from the excavated soils in the field and shipped to Chemical Waste Management's Port Arthur Facility for incineration.

3) A commercial operator shall remove, treat, and dispose of methyl bromide cylinders, if encountered.

   Methyl bromide canisters were not encountered during the excavation activities at Burial Sites 4- D, therefore this component of the ROD was not implemented.

4) Ground water shall be extracted, treated, and reinjected into the aquifer. Treatment for vinyl chloride, cis-l, 2-dichlorethene (cis-l, 2-DCE) and other volatile organic compounds (VOCs) shall be by air stripping. If PCB or dioxin concentrations exceed their respective MCL in the air stripper effluent, a granular activated carbon (GAC) unit will be added to the ground-water treatment train to meet the goal.

Construction and prove-out of the OU 4 ground-water treatment plant began in January 1994 and was completed in May 1995. Ground-water treatment is currently on-going and the plant meets the requirements set forth on the ROD. Since PCB and dioxin concentrations do not exceed the regulatory limits specified in the ROD, the GAC units were not installed.

5) Air emissions from the air stripper shall comply with Utah air quality regulations of 1.5 tons total VOCs per year and the National Emissions Standards for Hazardous Air Pollutants requirements for vinyl chloride of l0 ppm.

The treatment plant effectively meets the air discharge requirement set forth in the ROD without additional treatment.

6) Treated ground water shall be returned to the shallow aquifer using injection wells or infiltration galleries.

The effluent from the treatment plant is conveyed from the treatment plant and is reinjected into the shallow aquifer through a system of 22 injection wells in accordance with the ROD.

7) Secondary wastes, such as silts or spent GAC, shall be transported off site for RCRA compliant treatment or disposal.

Secondary wastes, primarily bag filter media, are shipped off-site and disposed of in accordance to ROD.

Remedial action goals for site soils are defined by point of compliance concentrations of 25 mg/kg of polychlorinated biphenyls (1-CBs [based on EPA Directive 9355.4-01FS]), 1 ug/kg total equivalent TCDD for dioxin and furans, and risk- based levels for VOCs, arsenic, and lead. Compliance was verified during the removal action through sampling and analysis of remaining soils.

Ground water remedial action goals for individual contaminants are drinking water MCLs. The point of compliance for ground water cleanup is defined by the area within the 2ug/l contour for vinyl chloride. Individual remedial action goals for soil and ground water are listed on tables 1 and 2.

TABLE 1
GROUND-WATER REMEDIATION CRITERIA

Chemical	Concentration (ug/l)
Benzene	5
cis-l, 2-DCE	70
Vinyl chloride	2
PCBs	0.5

TABLE 2
SOIL REMEDIATION CRITERIA

Chemical	Concentration (mg/kg)
Benzene	210
cis-l, 2-DCE	700
Vinyl chloride	3.2
Arsenic	35
Lead	500
PCBs	25a
2,3,7,8-TCDD (dioxins)	0.001b

a. Based on typical cleanup level at residential site.
b. Requirement to be considered.

In accordance with the OU 4 ROD, a series of remedial design documents were prepared and the remedy was installed. Final design documents were published for the remedy in May 1993. The soil remediation was completed in May 1995, and the ground-water treatment system became operational in July 1995. With the exception of the OU 4 Hotspot, all remedial actions for known contaminants were completed and the ROD was implemented as written.

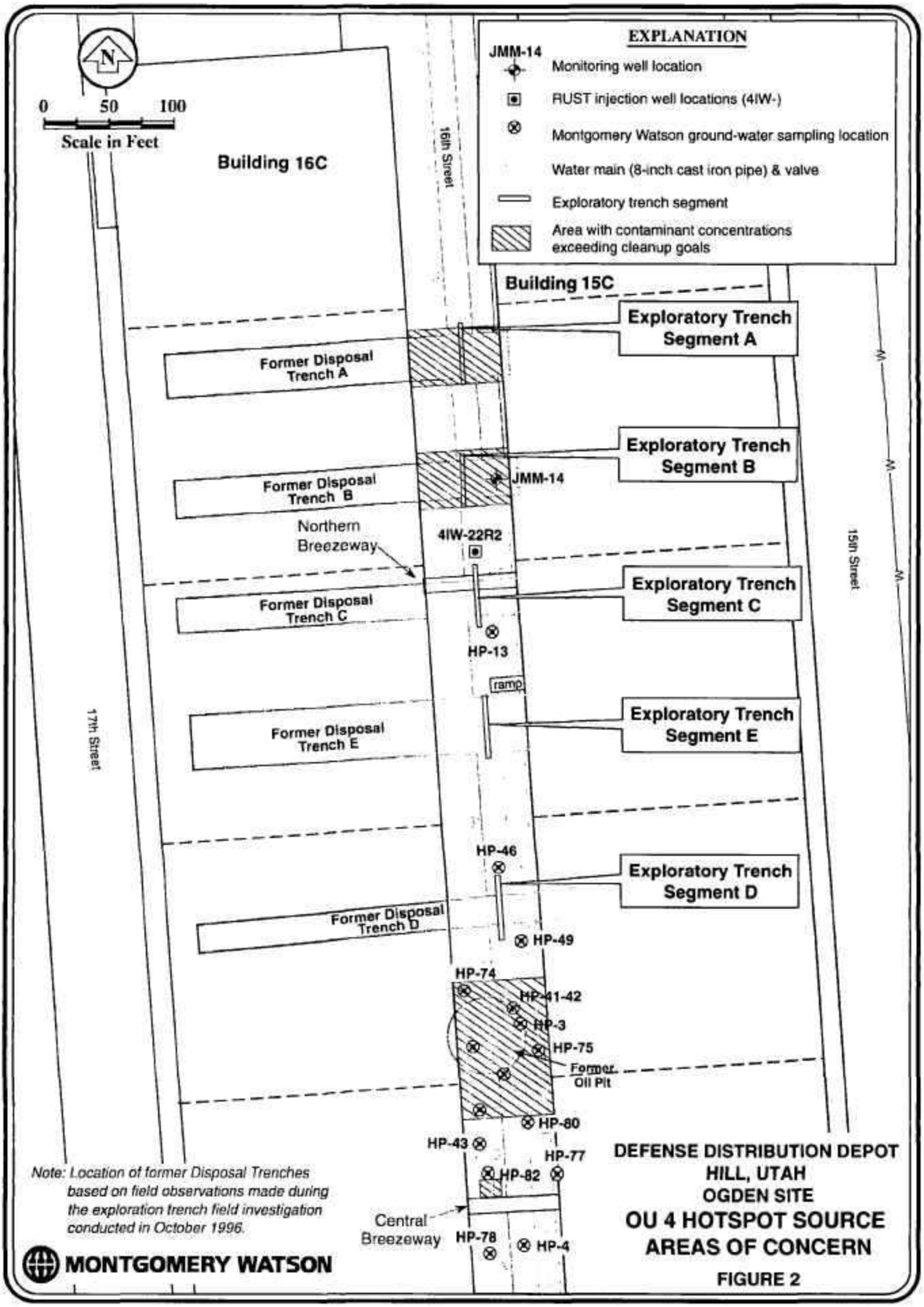
3.0 BASIS FOR THE DOCUMENT

As discussed earlier in this ROD Amendment, during the implementation of the original ROD remedy, a localized ground-water contaminant plume and associated source area were discovered. The source area extends beneath two existing warehouse buildings. Since the buildings are in continuous use, neither the buildings' floors nor the foundation elements can be disturbed to remove the soils located under the buildings. In addition, to reduce long-term O&M costs the Corp of Engineers wished to utilize a new and innovative water treatment process that would not transfer contaminants from one media to another (unlike air stripping), generate secondary wastes and would eliminate air emissions. Also, the existing OU 4 ground water treatment plant did not have sufficient excess capacity to treat extracted ground water from the OU 4 Hotspot. Therefore, a new water treatment plant was required. Since the original OU 4 ROD called for excavation and off-site disposal of contaminated soils, and ground-water treatment using air stripping, leaving contaminated soils in-place (i.e., primarily underlying buildings) and changing the ground water treatment method represent fundamental changes to the remedy selected in the ROD. This ROD Amendment provides for leaving contaminated soils in-place as well as changing the ground water treatment method.

Remediation alternatives are developed for the OU 4 Hotspot ground water and soils in *Final Operable Unit 4 Hotspot Ground-water Remediation System (Montgomery Watson, 1997b) and Final Operable Unit 4 Hotspot Investigation and Alternatives Analysis I Report Source Area Addendum (Montgomery Watson, 1997c*), respectively. Both of these documents are included in the Administrative Record.

3.1 DEVELOPMENT OF REMEDIAL ALTERNATIVES

The principal threats posed by the OU 4 Hotspot are the potential exposure of future residents or construction workers to contaminants within the OU 4 Hotspot source area, (Figure 2) and ground water contaminated by VOCs. Therefore, the primary concern for soil remediation is to remove, reduce or control these principal threats. Preliminary alternatives were evaluated under an engineering evaluation and cost analysis (EE/CA) and included only those technologies that have the potential for assembly into remedial alternatives.



Note: Location of former Disposal Trenches based on field observations made during the exploration trench field investigation conducted in October 1996.

MONTGOMERY WATSON

DEFENSE DISTRIBUTION DEPOT
HILL, UTAH
OGDEN SITE

OU 4 HOTSPOT SOURCE AREAS OF CONCERN

FIGURE 2

PROJECT NO. 1212018.02095076 4/22/99

3.1.1. OU 4 Hotspot Source Area

The remedial alternatives for OU 4 Hotspot soils which were evaluated as part of the EE/CA included:

Alternative 1 - No Action
Alternative 2 - Excavation /Off-site Landfill Disposal, Containment under Buildings, and ORC Enhancement
Alternative 3 - Excavation, Composting, and Containment under Buildings
Alternative 4 - Bioventing.

As stated in the *Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA* (EPA, 1993), each defined alternative should be evaluated against the short- and long-term aspects of three broad criteria. The evaluation criteria are:

1. Effectiveness: This criterion refers to the ability of an alternative to meet the objectives within the scope of the remedial action. The primary objectives to be discussed under this criterion include:

    - Overall protection of human health and the environment
    - Compliance with applicable or relevant and appropriate requirements (ARARs)
    - Short- and long-term effectiveness and permanence, and
    - Reduction of toxicity, mobility, or volume through treatment.

2. Implementability: The implementability criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation.

3. Cost: This criterion refers to the relative capital and operations and maintenance cost to implement a remedial alternative.

A description of each alternative and the results of the assessment of each alternative against the three criteria are presented in Table 3. A comparative analysis of alternatives was conducted to identify the advantages and disadvantages among the alternatives relative to one another so that key tradeoffs that would affect the remedy selection can be identified. The results of the comparative analysis are presented below.

Effectiveness. Alternatives 2 and 3 adequately address the remedial action objectives for OU 4 Hotspot soils by removing the contaminated soils from the area for subsequent treatment or disposal and by effectively isolating and containing contaminated soils which could not be removed through direct excavation, under Buildings 15C and 16C. Alternative 1 does not address the remedial action objectives since all contaminated soils would remain in place. Alternative 4 would address the remedial action objectives for total petroleum hydrocarbons (TPH) by treating soils in-situ.

However, the overall effectiveness of Alternative 4 relative to treatment of vinyl chloride is unknown.

Alternative 2 does not actually treat contaminated soils but merely transfers the contamination to an off-site landfill. A long-term liability would be associated with this alternative, however, this remedial alternative has been successfully employed previously at the site. All other alternatives provide treatment of contaminated soils.

Alternatives 2 and 3 provide for the protection of human health and the environment by preventing infiltration of fluids into the subsurface (continued floor maintenance will require development of procedures for inspections and floor repairs), restricting the installation of new underground utilities or other construction activities beneath the floors of the buildings, and providing provisions for the use of proper protective equipment if for any reason access through the concrete floor is required.

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
ALTERNATIVE DESCRIPTION	No active remedial actions would be taken. All contaminated soils would be left in place. Since contaminated soil would remain in place, five year reviews are required for this alternative. The buildings currently act as a barrier over the contaminated soil thereby limiting infiltration and preventing exposure. However, if the buildings and concrete floor slabs were removed, this alternative would no longer be protective of human health and the environment. This alternative does include provisions to limit future access to the soil beneath the buildings or to maintain the buildings and floor slabs.	Contaminated soil would be excavated and transported to an off-site landfill facility for disposal. Due to the presence of Building 15C and 16C, an unknown volume of contaminated soil will be left in-place beneath the buildings. Since the buildings are in excellent condition and are expected to be in continuous use, the buildings will not be removed nor will the building foundations be disturbed by excavation activities. Therefore, the contaminated soils are considered to be contained in place by the buildings. Since contaminated soils are left in place, this alternative includes posting warning signs, restricting construction activities under the building floor slabs, providing a restrictive covenant to the deed that would inform future land owners of the subsurface contamination and provide for continuing maintenance of the buildings and floor slabs. In addition, five year reviews are included in this alternative since contaminated soils are left beneath the buildings. Clean backfill from an off-site source would be used to close excavation. An Oxygen Releasing Compound (ORC™) would be introduced into the subsurface to stimulate the biodegradation of petroleum hydrocarbons and VOCs in the saturated zone.	Petroleum hydrocarbon contaminated soil would be excavated and placed in an on-site treatment cell for biological treatment. Metals contaminated soil present within former Disposal Trenches A, B and Test Pit C would be excavated and transported to an off-site landfill for disposal. Due to the presence of Building 15C and 16C, an unknown volume of contaminated soil will be left in-place beneath the buildings. Since the buildings are in excellent condition and are expected to be in continuous use the buildings will not be removed nor will the building foundations be disturbed by excavation activities. Therefore, the contaminated soils are considered to be contained in place by the buildings. Since contaminated soils are left in place, this alternative includes posting warning signs, restricting construction activities under the buildings, providing a restrictive covenant to the deed that would inform future land owners of the subsurface contamination and provide for continuing maintenance of the buildings and floor slabs. In addition, five year reviews are included in this alternative since contaminated soils are left beneath the buildings. Clean backfill from an off-site source would be used to close excavation. An Oxygen Releasing Compound (ORC) would be placed in the excavation to stimulate the biodegradation of petroleum hydrocarbons and VOCs in the saturated zone.	A bioventing system would be installed to enhance the natural biodegradation of soil contaminants. A vapor protection system would also be installed to protect the surrounding buildings, if necessary. Metals contaminated soils from within the former Disposal Trenches A, B and Test Pit C would be excavated and disposed of at an off-site landfill.

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
EFFECTIVENESS				
Overall Protection of Human Health and the Environment				
How protective is the alternative to human health and the environment?	Alternative is not protective of human health and the environment since contaminated soils are left in place.	Provides protection of human health by removing heavy metals and petroleum hydrocarbon contaminated soil. In addition, Buildings 15C and 16C will act to contain and isolate any contaminated soils left in place, thereby mitigating human exposure to contaminants. Some risks to ground water associated with contaminated soil left in place within the saturated zone and beneath Buildings 15C and 16C.	Provides protection of human health by removing heavy metals and petroleum hydrocarbon contaminated soil. In addition, Buildings 15C and 16C will act to contain and isolate any contaminated soil left in place, thereby mitigating human exposure to contaminants. Some risks to ground water associated with contaminated soil left in place within the saturated zone and beneath Building 15C and 16C.	Provides protection for human health and the environment by remediating contaminated soil within the Hotspot Source Area and removing heavy metal contaminated soil from the former disposal trenches. Bioventing is not a proven technology for the remediation of vinyl chloride, therefore the overall effectiveness of this alternative can not be assessed at this time.
Compliance with ARARs[a]				
Chemical Specific:	There are no chemical-specific ARARs for site soil.	There are no chemical-specific ARARs for site soil. Alternative relies on remedy for northern lobe of ground-water contaminant plume to satisfy chemical-specific ARARs for ground water	There are no chemical-specific ARARs for site soil. Alternative relies on remedy for northern lobe of ground-water contaminant plume to satisfy chemical-specific ARARs for ground water.	There are no chemical-specific ARARs for site soil. Uncertainty exists relative to achieving ARAR for vinyl chloride. Air emissions would satisfy requirements of federal and state statutes.
Location Specific:	There are no location-specific ARARs for site soil.	There are no location-specific ARARs for site soil.	There are no location-specific ARARs for site soil.	There are no location-specific ARARs for site soil or ground water.
Action Specific:	• R315-101 and R311-211 UAC (Specifies State of Utah's cleanup Policies) – Alternative would not comply since no contaminated material would be removed from the site.	Remedial alternative would be executed in compliance with OSHA regulations. Compliance with other action-specific ARARs are discussed as follows:	Remedial alternative would be executed in compliance with OSHA regulations. Compliance with other action-specific ARARs are discussed as follows:	Remedial alternative would be executed in compliance with OSHA regulations. Air emissions would satisfy requirements of 40 CFR Part 61.
	• R315-8-7 UAC (Specifies Closure and Post-closure standards) – Alternative does not comply since it does not control, minimize, or eliminate hazardous constituents.	• R315-101 and R311-211 UAC (Specifies State of Utah's cleanup Policies) – Alternative provides source control by leaving and maintaining concrete slabs.	• R315-101 and R311-211 UAC (Specifies State of Utah's cleanup Policies) – Alternative provides source control by leaving and maintaining concrete slabs.	

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
Action Specific (continued)	• 40 CFR Part 264, Subpart G (Specifies Federal Closure and Post-closure standards) - Alternative does not comply since it does not control, minimize, or eliminate hazardous constituents. • 40 CFR Part 264, Subpart F (Specifies requirements for detection and containment of releases) – Alternative does not provide for ground-water monitoring.	• R315-8-7 UAC (Specifies Closure and Post-closure standards) – Alternative complies with this ARAR by controlling and minimizing access to hazardous constituents by leaving concrete slabs in place. • R315-4 through –6UAC (Outlines requirements for generating, manifesting, and transporting of hazardous waste) – All activities associated with generating and transporting of hazardous waste to off-depot facilities will comply with this ARAR. If the soils under the buildings are disturbed, they will be handled in accordance to this ARAR. • R315-8-7 UAC (Specifies Closure and Post-closure standards) – This alternative will comply with this ARAR by removing the majority of the source area and protecting human health. • standards) - Alternative complies with this ARAR by controlling and minimizing contact with hazardous constituents and is protective of human health. • 40 CFR 268 (Land disposal restrictions) – Hazardous wastes generated during excavation will be managed in accordance with these requirements.	• R315-8-7 UAC (Specifies Closure and Post-closure standards) – Alternative complies with this ARAR by controlling and minimizing access to hazardous constituents by leaving concrete slabs in place. • R315-4 through –6UAC (Outlines requirements for generating, manifesting, and transporting of hazardous waste) – All activities associated with generating and transporting of hazardous waste to off-depot facilities will comply with this ARAR. If the soils under the buildings are disturbed, they will be handled in accordance to this ARAR. • R315-8-7 UAC (Specifies Closure and Post-closure standards) – This alternative will comply with this ARAR by removing the majority of the source area and protecting human health. • R315-13UAC (State of Utah land disposal restrictions) – Alternative complies with this ARAR since hazardous waste generated during excavation will be required to meet BDAT technologies and/or constituent concentrations. • 49 CFR 107, 171-177 (Hazardous Materials Transport) - This alternative will comply with all requirements for the transportation of hazardous materials to an off-depot location.	

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
Action Specific (continued)		• 40 CFR Part 264, Subpart F (Specifies requirements for detection and containment of releases) – Alternative complies with this ARAR by providing for ground-water monitoring and containment of the release by leaving and maintaining the concrete slabs. • 49 CFR 107, 171-177 (Hazardous Materials Transport) -- This alternative will comply with all requirements for the transportation of hazardous materials to an off-depot location	• 40 CFR Part 264, Subpart G (Specifies Federal Closure and Post-closure standards) - Alternative complies with this ARAR by controlling and minimizing contact with hazardous constituents and is protective of human health. • 40 CFR Part 264, Subpart F (Specifies requirements for detection and containment of releases) - Alternative complies with this ARAR by providing for ground-water monitoring and containment of the release by leaving and maintaining the concrete slabs. • 40 CFR 268 (Land disposal restrictions) – Hazardous wastes generated during excavation will be managed in accordance with these requirements.	
TBCs, other criteria, advisories, and guidance:	Not applicable.	Soil with contaminant concentrations exceeding cleanup goals would be excavated to achieve the health-risk based cleanup goals for VOCs and petroleum hydrocarbons.	Soil would be excavated to achieve the health-risk based cleanup goals for VOCs and petroleum hydrocarbons.	Soil would be treated to achieve the health-risk based cleanup goals for VOCs and petroleum hydrocarbons.
Long-Term Effectiveness and Permanence:				
What is the magnitude of the health and ecological risks associated with residuals that may remain?	Continued risks to human health and ground water are associated with the soils left in place.	Continued risks to ground water are associated with any soil left in place. Residual human health risks are considered negligible since residual soil would be at depth and not subject to direct contact by humans. Alternative relies on the remedy for the northern lobe of the ground-water contaminant plume to address ecological and human health risks associated with source area ground water.	Continued risks to ground water are associated with any soil left in place. Residual human health risks are considered negligible since residual soil would be at depth and not subject to direct contact by humans. Alternative relies on the remedy for the northern lobe of the ground-water contaminant plume to address ecological and human health risks associated with source area ground water.	Incomplete treatment of vinyl chloride may result in continued environmental and human health risk.

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
How adequate and reliable are controls for management of treatment residuals and untreated wastes?	Not applicable to this alternative relative to treatment residuals. Contaminated soil left in place would be uncontrolled resulting in a potential source of ground-water contamination.	Contaminated soil left in place would be uncontrolled resulting in a potential source of ground-water contamination. However, the presence of Buildings 15C and 16C mitigate the mobilization of contaminants due to surface water infiltration.	Contaminated soil left in place would be uncontrolled resulting in a potential source of ground-water contamination. However, the presence of Buildings 15C and 16C mitigate the mobilization of contaminants due to surface water infiltration.	Alternative may not adequately address vinyl chloride impacts in site soil since technology is unproven for this constituent.
Reduction of Toxicity, Mobility, or Volume Through Treatment				
What is the quantity of material to be treated?	No material is treated.	Conservative estimates based on field data indicate approximately 3,800 cubic yards of soil require disposal.	Conservative estimates based on field data indicate approximately 3,800 cubic yards of soil require treatment.	This alternative would address approximately 3,200 cubic yards of soil contained in the vadose zone within the Oil Pit. Approximately 550 cubic yards of metals contaminated soil would be transported to a landfill for disposal.
To what extent is the total toxicity, mobility, or volume of contaminants reduced?	There is no reduction in the toxicity, mobility, or volume of contaminants.	Excavation of contaminated soil would reduce the volume of soil contaminants within the Hotspot Source Area. Placing contaminated soil in an industrial or hazardous waste landfill would reduce the mobility of contaminants.	Excavation of contaminated soil would reduce the volume of soil contaminants within the Hotspot Source Area. Placing contaminated soil in an engineered cell for treatment would reduce the mobility and toxicity of all organic contaminants.	This alternative reduces the toxicity of soil contaminants through biodegradation. Alternative does not address reduction of mobility and volume. Since field performance data from other sites employing this technology for similar contaminants are not available, the actual level of reduction of toxicity, mobility, and volume for vinyl chloride cannot be evaluated.
What residuals remain and to what degree?	Approximately 4600 cubic yards of soil would remain within the OU 4 Hotspot Source Area.	Contaminated soil which could not be excavated from the vicinity of the foundation elements of Buildings 15C and 16C (approximately 1,850 cubic yards) or below the shallow water table (approximately 200 cubic yards) would remain within the Hotspot Source Area.	Contaminated soil which could not be excavated from the vicinity of the foundation elements of Buildings 15C and 16C (approximately 1,850 cubic yards) or below the shallow water table (approximately 200 cubic yards) would remain within the Hotspot Source Area.	Alternative may not adequately treat vinyl chloride resulting in residual concentrations of this constituent in the subsurface. Petroleum hydrocarbons and other chlorinated VOCs present at the site would be treated. Contaminated soils below the shallow water table (approximately 200 cubic yards) would not be treated.
What are the uncertainties associated with land disposal of residuals/untreated wastes?	Not applicable to this alternative.	The landfill used for disposal of excavated soil would satisfy RCRA requirements. Long-term liability is associated with this alternative if the landfill is ever suspected of releasing contaminants to the environment.	The landfill used for disposal of excavated heavy metal contaminated soil would satisfy RCRA requirements. Long-term liability is associated with this alternative if the landfill is ever suspected of releasing contaminants to the environment. Landfill disposal of treated soil would have limited long-term liability.	Not applicable to this alternative.

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
To what extent are the effects of treatment irreversible?	Not applicable to this alternative.	Landfilling is considered irreversible.	Biological treatment and landfilling are considered irreversible.	Biological treatment would permanently reduce the volume and toxicity of petroleum hydrocarbons and VOC contaminants, therefore treatment is considered irreversible. Treatment performance for vinyl chloride is not proven.
Does the alternative satisfy regulatory preference for treatment?	No	Since contaminated soil is transferred from site to site, this alternative would not satisfy regulatory preference for treatment. Ground water would be treated using the remedy for the northern lobe of the Hotspot ground-water contaminant plume.	Alternative satisfies regulatory preference for treatment of impacted soil.	Alternative satisfies regulatory preference for treatment of impacted soil.
Short-Term Effectiveness:				
Are there risks to the community during remedial actions?	No additional risk is associated with this alternatives since no remedial actions are performed.	Some risks to the community are associated with this alternative during transportation of contaminated soil.	Some risks to the community are associated with this alternative during transportation of contaminated soil.	No additional risks to the community are associated with this alternative.
Are there risks to workers during remedial actions?	No	Dermal contact and inhalation risks to workers are associated with excavation activities. Risks would be reduced using health and safety procedures.	Dermal contact and inhalation risks to workers are associated with excavation activities. Risks would be reduced using health and safety procedures.	Dermal contact and inhalation risks to workers are associated with drilling activities, although these risks are lower than risks from excavation. Risks would be reduced using health and safety procedures.
Are there risks to the environment with implementation of alternative?	No	Dust control measures would be used to minimize mobilization of contaminants during excavation activities. Soil left in place may pose a continued risk to the environment.	Dust control measures would be used to minimize mobilization of contaminants during excavation activities. No additional risks associated with excavated soils since treatment occurs within a lined treatment cell. Soil left in place may pose a continued risk to the environment.	No additional risks to the environment associated with the construction of this alternative. Incomplete treatment of vinyl chloride poses a continued environmental risk.

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
What is the time required to reach RAOs?	The RAOs would not be achieved.	RAOs would be achieved in about one month after initiation of field activities. Total time to achieve RAOs may be longer depending upon soil characterization and manifesting.	Remediation times are unknown due to nature of biodegradation process and uncertainties in remediating vinyl chloride.	Remediation times are unknown due to nature of biodegradation process and uncertainties in remediating vinyl chloride.
IMPLEMENTABILITY				
Technical Feasibility				
What difficulties are expected during construction and operation?	Not applicable. No construction or operation will take place.	Presence of Buildings 15C and 16C will limit the amount of soil actually excavated. Breezeways may limit the size of excavation equipment used and make conveyance of excavated soil difficult.	Presence of Buildings 15C and 16C will limit the amount of soil actually excavated. Breezeways may limit the size of excavation equipment used and make conveyance of excavated soil difficult.	Presence of buildings require vapor control measures and monitoring.
What is the likelihood the alternative will meet the required RAOs?	Alternative will not meet the RAOs.	Alternative will meet RAOs for excavated soil.	Alternative will meet RAOs for excavated soil.	Alternative will meet RAOs for soil relative to petroleum hydrocarbon contamination. Uncertain whether alternative will achieve RAOs relative to vinyl chloride.
Is there flexibility to undertake additional remedial actions, if necessary?	Yes, additional process options could be implemented if necessary.	Yes, additional process options could be implemented to address soil left in place.	Yes, additional process options could be implemented to address soil left in place.	No, system could not be easily modified to perform as an SVE system.
How well can the alternative be monitored?	Not applicable to this alternative.	Confirmation sampling of the excavation sidewalls to verify removal and to quantify contaminated soils left in place. Continued ground water monitoring to determine if contaminants under the buildings are leaching to ground water	Soil sampling would be a component of the bioremediation process. This sampling would be used to monitor the effectiveness of the treatment process.	Respiration tests would be required to monitor levels of oxygen and carbon dioxide in the subsurface. Soil/ground-water sampling would confirm final cleanup.
Administrative Feasibility				
What difficulties are expected in obtaining approvals from other agencies?	Implementation of this alternative would require a ROD-Amendment to the OU 4 ROD. Regulatory support of this alternative would require approval of the ROD-Amendment.	None expected since this alternative has previously been approved in the OU 4 ROD. Regulatory approval would be required to leave contaminated soil in place.	Implementation of this alternative would require a ROD-Amendment to the OU 4 ROD. Regulatory support of this alternative would require approval of the ROD-Amendment.	Implementation of this alternative would require a ROD-Amendment to the OU 4 ROD. Regulatory support of this alternative would require approval of the ROD-Amendment.

TABLE 3

EVALUATION OF REMEDIAL ALTERNATIVES FOR HOTSPOT SOURCE AREA
(CONTINUED)

Criteria	Alternative 1 No Action	Alternative 2 Excavation, Off-site Landfill Disposal, and Containment Under Buildings	Alternative 3 Excavation, Composting, and Containment Under Buildings	Alternative 4 Bioventing
What is the availability and capacity of off-site treatment, storage, and disposal services?	Not applicable to this alternative.	Landfill space is available to accept the soil excavated from the site.	Landfill space is available to accept the heavy metal contaminated soil excavated from the site. Since DDOU is being turned over to the Local Reuse Agency (LRA), vacant land may not be available on DDOU to locate the treatment cell. Municipal landfills are available to accept treated soil.	Not applicable since soil is treated in situ.
Availability of Services and Materials				
Are services and materials available?	Not applicable to this alternative.	The materials and services required to implement this alternative are readily available.	The materials and services required to implement this alternative are readily available. Landfill space is available to accept treated soils.	The materials and services required to implement this alternative are readily available.
Is the technology generally available and sufficiently demonstrated?	Not applicable to this alternative.	Landfilling is a proven disposal method for soil impacted by petroleum hydrocarbons, chlorinated VOC, and inorganic contaminants. Permitted landfills exist within the State of Utah to accept site soil. Landfill capacity for the estimated volume of excavated soil is available.	Biological treatment is a proven technology for petroleum hydrocarbons and volatile organic compounds. Landfilling is a proven disposal method for soil impacted by inorganic contaminants. Permitted landfills exist within the State of Utah to accept site soil. Landfill capacity for the estimated volume of excavated soil is available.	Bioventing is a proven technology for the remediation of petroleum hydrocarbons and chlorinated VOC contaminants. Although literature references suggest that the addition of methane will reduce concentrations of vinyl chloride in soil, there is insufficient field data to support this.
COST				
Capital costs:	$59,000	$1,732,000	$836,000	$598,000
Operating and maintenance costs:	$45,000	--	$92,000	$65,000
Present worth costs(b)	$566,000	$1,732,000	$1,872,000	$1,330,000

(a) Applicable or relevant and appropriate requirement
(b) Present Worth costs evaluated based on an 8% interest rate for a period of 1 year.

Implementability. Alternatives 2 and 3 include excavation as an essential component of the treatment process. The degree of difficulty in conducting the soil excavation would depend on the depth of excavation and accessibility of the excavation equipment between the existing buildings. In addition, dust control measures would have to be implemented in conjunction with Alternatives 2 and 3, and would also require the associated excavation permits. The institutional controls associated with Alternatives 2 and 3 (i.e., warning signs, notices to deeds, and restrictive covenants) are relatively easy to implement.

Alternative 4 provides for in-situ treatment of the OU 4 Hotspot soil. Even though this in-situ alternative includes drilling and installation of vapor wells, the quantity of soil to be excavated in conjunction with Alternative 4 is substantially less compared to Alternatives 1 through 3.

Cost. The total cost for the ex-situ alternatives (Alternatives 2 and 3) are relatively close (Table 3) and range from $1,732,000 to $1,872,000. Alternative 1 is the most cost competitive, however, it does not achieve the remedial action objectives since all contaminated soils would remain in-place.

Although Alternative 4 is cheaper to implement compared to Alternatives 2 and 3, the relative cost difference is within the accuracy of the cost estimates (+ 50 percent to -30 percent). Therefore, cost is not considered a primary factor in selecting one alternative over another.

3.1.2. Northern Lobe of OU 4 Ground Water Contaminant Plume

The remedial alternatives for the northern lobe of the OU 4 ground water plume which were evaluated as part of the EE/CA included:

Alternative 1 - Ground Water Extraction, Ground-Water Treatment by Existing OU 4 Air Stripper, Treated Water Discharge to Publicly Owned Treatment Works (POTW)

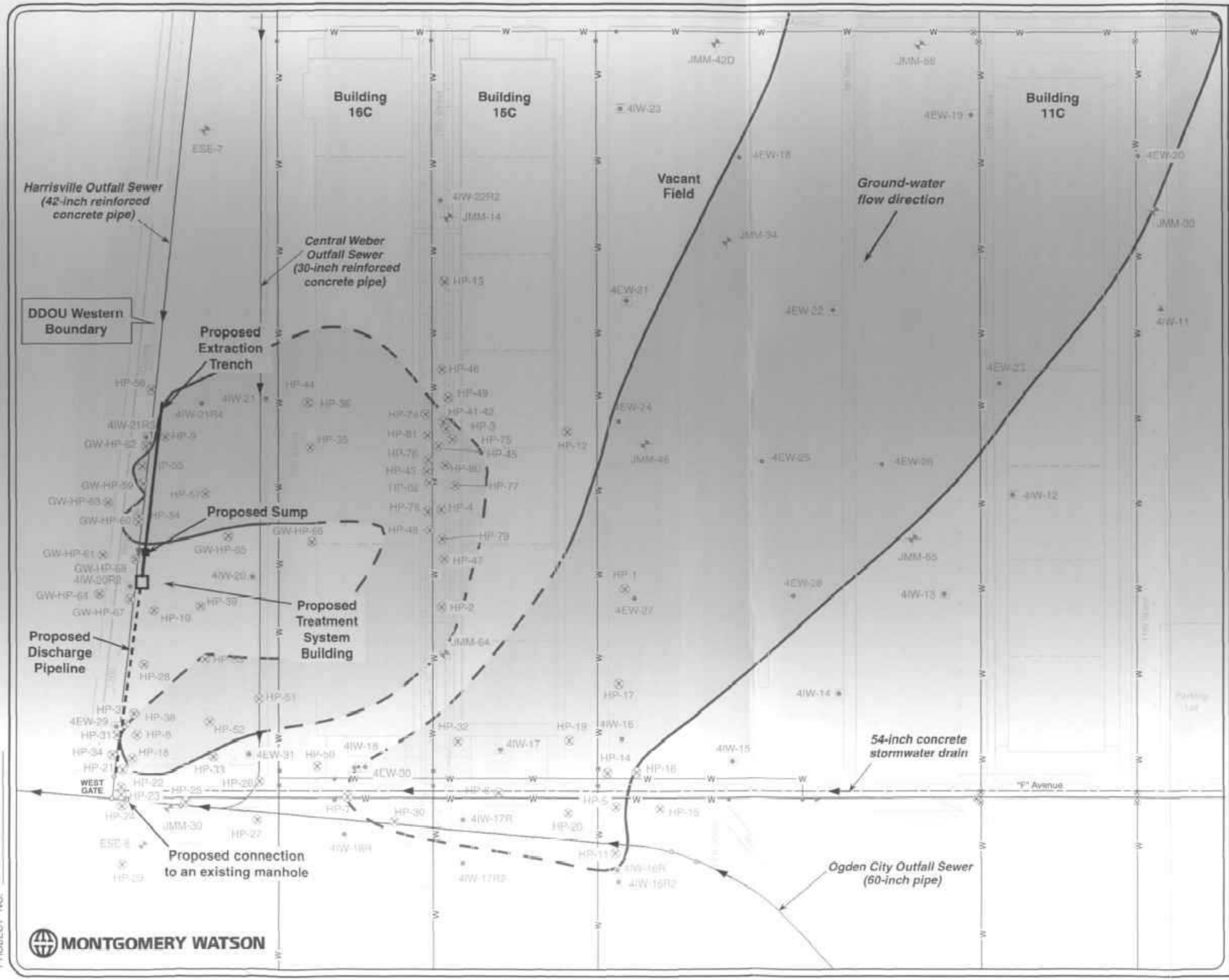
Alternative 2 - Ground Water Extraction, Ground- Water Treatment by Low-Profile Air Stripper, Treated Water Discharge to POTW

Alternative 3 - Ground Water Extraction, Ground-Water Treatment by Ozonation, Treated Water Discharge to POTW

Each remedial alternative was evaluated against the three criteria as described previously. Table 4 presents a description of each alternative and the results of the assessment of each alternative against the three criteria. Figure 3 presents a generalized layout of the extraction trench and location of sewer discharge. A comparative analysis of alternatives was then conducted to identify the advantages and disadvantages among the alternatives relative to one another so that key tradeoffs that would affect the remedy selection can be identified. The results of the comparative analysis are presented below.

Effectiveness. All alternatives employ a similar technology for ground-water containment and extraction (extraction trench), and provide for a similar discharge methodology (sanitary sewer). The ground-water treatment technologies associated with each alternative are capable of meeting the remedial action objectives.

Alternatives 1 and 2 do not actually treat the ground- water contaminants but merely disperse them into another medium (air). Even though no air pollution control technologies are deemed necessary at this time nor proposed with Alternatives 1 and 2, the air pollution control technologies may become necessary if the ground-water contaminant concentrations increase in the future or if the air quality criteria are modified. Alternative 3 (Ozonation) provides for actual treatment and destruction of ground-water contaminants, and is therefore, not subject to future addition of an air pollution control technology.



PROJECT NO. 1212118.02095076 4/22/99

EXPLANATION

- JMM-23 — Monitoring well locations
- 4IW-23 — RIJST extraction well location (4EW-), and injection well locations (4IW-)
- 4IW-18 — RIJST ground-water sampling location (4IW-)
- HP-79 — Montgomery Watson ground-water sampling location
- Water main (8-inch corrugated iron pipe) & valve
- Outfall sewer and manhole
- Fence
- Railroad tracks
- Extent of vinyl chloride plumes with concentrations >2 µg/L (dashed where inferred)

Note: The configuration of the Hotspot vinyl chloride plume is based on ground-water analytical data generated during four different sampling events from April 1994 through December 1995. Therefore, the data should only be used collectively as a general indication of the distribution of contamination.

The configuration of the main OU 4 vinyl chloride plume is based on ground-water analytical data presented in the OU 4 Quarterly Operations Report—Year 1 Quarter 4, dated September 1996 (OI-IM).

Location of former disposal trenches and oil pit taken from 1950 aerial photograph.

DEFENSE DISTRIBUTION DEPOT
HILL, UTAH — OGDEN SITE
OPERABLE UNIT 4 HOTSPOT

LAYOUT OF NORTHERN LOBE OF OU4 HOTSPOT GROUND-WATER PLUME ALTERNATIVES

FIGURE 3

TABLE 4

EVALUATION OF REMEDIAL ALTERNATIVES FOR NORTHERN LOBE OF HOTSPOT GROUND-WATER CONTAMINANT PLUME

Criteria	Alternative 1 Extraction Trench, Existing Air Stripper, POTW Discharge	Alternative 2 Extraction Trench, Low-Profile Air Stripper, POTW Discharge	Alternative 3 Extraction Trench, Ozonation, POTW Discharge
ALTERNATIVE DESCRIPTION	An extraction trench would be installed along the western Depot boundary and sized to effectively capture the northern lobe of the OU 4 Hotspot contaminant plume. Since the extraction would be located downgradient of existing injection wells 41W-21 and 41W-22, these wells would be abandoned to limit treatment of clean water. Extracted ground water would be conveyed in a new double-walled pipeline to the existing OU 4 treatment system. The existing control panel would be modified to handle the additional flow. A portion of the treated water equal to that extracted from the trench would be discharged to the sanitary sewer through a manhole connection.	This alternative consists of the installation of the extraction trench as discussed in Alternative 1. The extracted ground water would be conveyed to a low-profile air stripper which would be located near the western Depot boundary. All treated water from the air stripper would be discharged to the sanitary sewer through a manhole connection.	This alternative consists of the installation of the extraction trench as discussed in Alternative 1. The extracted ground water would be conveyed to an ozonation unit which would be located near the western Depot boundary. All treated water from the ozonation treatment system would be discharged to the sanitary sewer through a manhole connection.
EFFECTIVENESS			
Overall Protection of Human Health and the Environment			
How protective is the alternative to human health and the environment?	Provides overall protection to human health and the environment by containing the Hotspot ground-water contaminant plume and actively removing ground-water contaminants, although contaminants are released to the atmosphere.	Provides overall protection to human health and the environment by containing the Hotspot ground-water contaminant plume and actively removing ground-water contaminants, although contaminants are released to the atmosphere.	Provides overall protection to human health and the environment by containing the Hotspot ground-water contaminant plume and actively destroying ground-water contaminants to innocuous byproducts.
Compliance with ARARs[a]			
Chemical Specific:	Existing OU 4 treatment system has been designed to reduce ground-water contaminant levels to achieve the chemical-specific ARARs for ground water.	System would be designed to meet chemical-specific ARARs for ground water.	System would be designed to meet chemical-specific ARARs for ground water.
Location Specific:	There are no location-specific ARARs for ground water at OU 4.	There are no location-specific ARARs for ground water at OU 4.	There are no location-specific ARARs for ground water at OU 4.
Action Specific:	Remedial alternative would be executed in compliance with OSHA requirements. Existing systems air discharge is in compliance with Federal and State of Utah requirements. Injection wells 41W-20 and 41W-21 would be abandoned in accordance with U.A.C. Rule R625-4.	Remedial alternative would be executed in compliance with OSHA requirements. Systems would be designed such that air emissions would be in compliance with Federal and State of Utah requirements. Injection wells 41W-20 and 41W-21 would be abandoned in accordance with U.A.C. Rule R625-4.	Remedial alternative would be executed in compliance with OSHA requirements. Injection wells 41W-20 and 41W-21 would be abandoned in accordance with U.A.C. Rule R625-4.
TBCs, other criteria, advisories, and guidance:	Performance monitoring would be required to ensure that TPH is being reduced to cleanup levels as specified in the RBCA guidance. It is believed that the existing system will treat the extracted ground water to these standards.	Performance monitoring would be required to ensure that TPH is being reduced to cleanup levels as specified in the RBCA guidance.	Performance monitoring would be required to ensure that TPH is being reduced to cleanup levels as specified in the RBCA guidance.
Long-Term Effectiveness and Permanence:			
What is the magnitude of the health and ecological risks associated with residuals that may remain?	Risks to the environment will exist until the RAOs have been achieved. Hydraulic containment will mitigate the risks to off-Depot residents.	Risks to the environment will exist until the RAOs have been achieved. Hydraulic containment will mitigate the risks to off-Depot residents.	Risks to the environment will exist until the RAOs have been achieved. Hydraulic containment will mitigate the risks to off-Depot residents.

TABLE 4

EVALUATION OF REMEDIAL ALTERNATIVES FOR NORTHERN LOBE OF HOTSPOT GROUND-WATER CONTAMINANT PLUME (CONTINUED)

Criteria	Alternative 1 Extraction Trench, Existing Air Stripper, POTW Discharge	Alternative 2 Extraction Trench, Low-Profile Air Stripper, POTW Discharge	Alternative 3 Extraction Trench, Ozonation, POTW Discharge
How adequate and reliable are controls for management of treatment residuals and untreated wastes?	Hydraulic containment is reliable for preventing migration of ground-water contaminant plume. Air stripper does not generate treatment residuals which would require long-term management.	Hydraulic containment is reliable for preventing migration of ground-water contaminant plume Air stripper does not generate treatment residuals which would require long-term management.	Hydraulic containment is reliable for preventing migration of ground-water contaminant plume. Ozonation would convert the contaminants to innocuous byproducts.
Reduction of Toxicity, Mobility, or Volume Through Treatment			
What is the quantity of material to be treated?	Conservative estimates indicate that there are approximately 2.5 million gallons of impacted ground water within the northern lobe of the ground-water contaminant plume. This estimate includes ground water beneath the Hotspot Source Area.	Conservative estimates indicate that there are approximately 2.5 million gallons of impacted ground water within the northern lobe of the ground-water contaminant plume. This estimate includes ground water beneath the Hotspot Source Area.	Conservative estimates indicate that there are approximately 2.5 million gallons of impacted ground water within the ground-water contaminant plume. This estimate includes ground water beneath the Hotspot Source Area.
To what extent is the total toxicity, mobility, or volume of contaminants reduced?	Volume of contaminants would be reduced through ground-water extraction and treatment. Air stripping does not reduce the toxicity or mobility of contaminants.	Volume of contaminants would be reduced through ground-water extraction and treatment. Air stripping does not reduce the toxicity or mobility of contaminants.	Volume of contaminants would be reduced through ground-water extraction and treatment. Ozonation would result in the destruction of ground-water contaminants thereby providing complete reduction in toxicity.
What residuals remain and to what degree?	Treatment residuals consist of treated water which meets Federal and State of Utah water quality standards and POTW discharge standards. In addition, air discharge would be in compliance with Federal and State air quality requirements.	Treatment residuals consist of treated water which meets Federal and State of Utah water quality standards and POTW discharge standards. In addition, air discharge would be in compliance with Federal and State air quality requirements.	Treatment residuals consist of treated water which meets Federal and State of Utah water quality standards and POTW discharge standards.
To what extent are the effects of treatment irreversible?	Extracted ground water would be treated for the removal of contaminants. Hence the effects of the treatment are irreversible.	Extracted ground water would be treated for the removal of contaminants. Hence the effects of the treatment are irreversible.	Ozonation is effective for the destruction of contaminants in ground water and is therefore considered irreversible.
Does the alternative satisfy regulatory preference for treatment?	Air stripping is a common treatment technology for TPH and chlorinated VOCs, therefore this alternative would satisfy regulatory preference for treatment.	Air stripping is a common treatment technology for TPH and chlorinated VOCs, therefore this alternative would satisfy regulatory preference for treatment.	Ozonation is a common treatment technology for TPH and chlorinated VOCs, therefore this alternative would satisfy regulatory preference for treatment.
Short-Term Effectiveness: Are there risks to the community during remedial actions?	No additional risks to the community are associated with this alternative.	No additional risks to the community are associated with this alternative.	No additional risks to the community are associated with this alternative.
Are there risks to workers during remedial actions?	Dermal contact and inhalation risks to site workers are associated with the installation of the extraction trench and conveyance piping excavation activities. These risks would be reduced using health and safety procedures.	Dermal contact and inhalation risks to site workers are associated with the installation of the extraction trench and conveyance piping excavation activities. These risks would be reduced using health and safety procedures.	Dermal contact and inhalation risks to site workers are associated with the installation of the extraction trench and conveyance piping excavation activities. These risks would be reduced using health and safety procedures.

TABLE 4

EVALUATION OF REMEDIAL ALTERNATIVES FOR NORTHERN LOBE OF HOTSPOT GROUND-WATER CONTAMINANT PLUME (CONTINUED)

Criteria	Alternative 1 Extraction Trench, Existing Air Stripper, POTW Discharge	Alternative 2 Extraction Trench, Low-Profile Air Stripper, POTW Discharge	Alternative 3 Extraction Trench, Ozonation, POTW Discharge
Are there risks to the environment with implementation of alternative?	Dust control measures will be utilized during excavation activities. Additional environmental risks are considered minimal.	Dust control measures will be utilized during excavation activities. Additional environmental risks are considered minimal.	Dust control measures will be utilized during excavation activities. Additional environmental risks are considered minimal.
What is the time required to reach RAOs?	Based on conservative estimates, the ground-water RAOs should be achieved in approximately 10 years.	Based on conservative estimates, the ground-water RAOs should be achieved in approximately 10 years.	Based on conservative estimates, the ground-water RAOs should be achieved in approximately 10 years.
IMPLEMENTABILITY			
Technical Feasibility			
What difficulties are expected during construction and operation?	The current OU 4 treatment system is currently running near capacity and is experiencing fouling of injection facilities. The existing system will need to be temporarily shutdown to connect the new influent lines. The additional extraction facilities will require modifications to the existing main control system to ensure that the system continues to operate as designed. The proposed extraction trench location is in an area with numerous overhead and underground utilities which may make construction difficult.	Excavation, installation of piping and the air stripper should be routine. The proposed extraction trench location is in an area with numerous overhead and underground utilities which may make construction difficult.	Excavation, installation of piping and the ozonation equipment should be routine. System start-up and prove-out may cause some difficulty but these are considered manageable. Ozonation equipment may require more intensive maintenance during the life of the remediation system. The proposed extraction trench location is in an area with numerous overhead and underground utilities which may make construction difficult.
What is the likelihood the alternative will meet the required RAOs?	Upon verification that hydraulic containment is achieved and given that air stripping is a known technology for the remediation of TPH and chlorinated VOCs, this alternative will meet the RAOs.	Upon verification that hydraulic containment is achieved and given that air stripping is a known technology for the remediation of TPH and chlorinated VOCs, this alternative will meet the RAOs.	Upon verification that hydraulic containment is achieved and given that ozonation is a known water treatment technology capable of remediating TPH and chlorinated VOCs, this alternative will meet the RAOs.
Is there flexibility to undertake additional remedial actions, if necessary?	Yes, additional extraction and/or treatment facilities could easily be added to shorten remediation time.	Yes, additional extraction facilities could easily be added to shorten remediation time. The air stripper is modular and could easily be modified if necessary.	Yes, additional extraction facilities could easily be added to shorten remediation time. Additional process option, i.e. GAC or UV oxidation, could be easily added to the process train.
How well can the alternative be monitored?	The performance of the existing system is currently being monitored. Additional monitoring wells will be required to monitor the hydraulic and contaminant removal performance of the modified system.	Influent and effluent sampling can easily be implemented to monitor the performance of the system. Ground-water monitoring well installation and a ground-water monitoring program are easy to implement to monitor the hydraulic and contaminant removal performance of the alternative.	Influent and effluent sampling can easily be implemented to monitor the performance of the system. Ground-water monitoring well installation and a ground-water monitoring program are easy to implement to monitor the hydraulic and contaminant removal performance of the alternative.
Administrative Feasibility			
What difficulties are expected in obtaining approvals from other agencies?	It is anticipated that regulatory approval would not be difficult since the existing system is already approved. Discharge to the sanitary sewer would require permitting from the POTW.	It is anticipated that regulatory approval would not be difficult since air stripping is the remedy approved in the OU 4 ROD. Discharge to the sanitary sewer would require permitting from the POTW.	Implementation of this alternative would require a ROD-Amendment since ozonation represents a deviation from the OU 4 ROD. Regulatory support of this alternative require approval of the ROD-Amendment. Discharge to the sanitary sewer would require permitting from the POTW.

TABLE 4

EVALUATION OF REMEDIAL ALTERNATIVES FOR NORTHERN LOBE OF HOTSPOT GROUND-WATER CONTAMINANT PLUME (CONTINUED)

Criteria	Alternative 1 Extraction Trench, Existing Air Stripper, POTW Discharge	Alternative 2 Extraction Trench, Low-Profile Air Stripper, POTW Discharge	Alternative 3 Extraction Trench, Ozonation, POTW Discharge
Availability of Services and Materials			
Are services and materials available?	Excavation services and piping materials are readily available.	Excavation services and piping materials are readily available. Low-profile air strippers are commercially available.	Excavation services and piping materials are readily available. Ozonation equipment is commercially available.
Is the technology generally available and sufficiently demonstrated?	Air stripping is a commercially available technology and has been demonstrated to be effective for the remediation of TPH and chlorinated VOCs at numerous sites.	Air stripping is a commercially available technology and has been demonstrated effective for the remediation of TPH and chlorinated VOCs at numerous sites.	Ozonation is a commercially available technology. Ozonation has been successfully used for water treatment, although its use in remediation is considered limited.
COST			
Capital costs:	$538,000	$419,000	$507,000
Operating and maintenance costs:	$91,600	$88,000	$89,000
Present worth costs[b]	$1,153,000	$1,009,000	$1,104,000

(a) Applicable or relevant and appropriate requirement.

(b) Present worth cost is calculated based on a 8% interest rate over a 10-year term.

Implementability. All alternatives are relatively easy to implement. The ground- water extraction and treatment technologies are commercially available and have been widely implemented at the ground-water remediation sites.

Alternative 2 (Low-Profile Air Stripper) can be modified easily to accommodate additional flow and/or increased contaminant concentrations compared to the other ground-water alternatives. Additional shallow trays can easily be added to the tray air stripper with minimum down time and installation details. The existing air stripper (Alternative 1) does not have any additional capacity beyond the initial flow to be added from the extraction trench (approximately 25 gpm). Modifications to the ozonation system may require reconfiguration of the entire system, including the ozone generator and the feed system, could be significantly more expensive, and result in a relatively more down time compared to Alternative 1.

Cost. The total cost for alternatives are relatively close (Table 4) and range from $1,009,00 to $1,153,000. Given the accuracy of the cost estimates (+ 50 percent to -30 percent), the total cost for Alternatives 1, 2, and 3 are essentially the same. Therefore, cost is not considered a primary factor in selecting one alternative over another.

4.0 DESCRIPTION OF NEW ALTERNATIVES

The purpose of this section is to provide a comparison between the original ROD remedy and the new remedy implemented for the OU 4 Hotspot.

4.1 DESCRIPTION OF REMEDIES

4.1.1 Original ROD Remedy

The selected remedy for OU 4 as described in the ROD consisted of off-site landfill disposal of soil and debris and on- site ground- water treatment using air stripping. The following discussion highlights the components of the original ROD remedy.

Under the original ROD remedy, contaminated soil and debris in Burial Sites 4-A and 4-E shall be excavated, tested using TCLP methods and for F001 through F005 status, and placed in an off site RCRA hazardous waste landfill. Soils failing F001 through F005 criteria shall be treated by the receiving facility using compliant stabilization/fixation methods. Material failing land disposal criteria for dioxins shall be transported to a commercial incineration facility for thermal treatment. The key ARARs for the soil remedy include RCRA land disposal and closure regulations and State of Utah Corrective Action Cleanup Standards Policy for cleanup levels. Additional discussions relative to ARARs are presented in Table 3.

Ground water will be extracted, treated, and reinjected into the aquifer. Treatment for vinyl chloride, cis-l, 2-dichlorethene (cis-l, 2-DCE) and other volatile organic compounds (VOCs) will be by air stripping. The treatment system will reduce contaminant concentrations to levels which are below their respective maximum contaminant level (MCL). If PCB or dioxin concentrations exceed their respective MCL in the air stripper effluent, a granular activated carbon (GAC) unit will be added to the ground-water treatment train to meet the goal. Treated ground water will be returned to the shallow aquifer using injection wells or infiltration galleries. The key ARAR for the ground water remedy are the maximum contaminant levels as promulgated under the Safe Drinking Water Act. Air emissions from the air stripper shall comply with Utah air quality regulations of 1.5 tons total VOCs per year and the National Emissions Standards for Hazardous Air Pollutants requirements for vinyl chloride of 10 ppm.

4.1.2 Amended ROD Remedy

The selected remedy for the OU 4 Hotspot consists of excavation and off-site disposal of soils (former oil pit and disposal trenches) between the buildings, containment of

contaminated soils under the buildings, institutional controls, ground water collection and treatment through ozonation, and In-situ Treatment of Oil Pit soils.

Under the amended remedy, contaminated soils located between Buildings 359 and 367 were excavated and disposed of off-site at a RCRA permitted landfill facility. Contaminated soils located beneath the building are contained in-place by the foundations of the buildings. Since contaminated materials remain in-place, institutional controls prohibiting disturbance of the concrete floor and subsurface soils are also included as a component of this remedy. A detailed discussion of ARARs is presented in Table 3.

Ground water within the OU 4 Hotspot contaminant plume is being remediated using a 300-ft long extraction trench, treatment, and sanitary sewer discharge. Extracted ground water enters an ozonation treatment system which completely destroys vinyl chloride and other VOC's present in the ground water within the OU 4 Hotspot. The ozonation system reduces vinyl chloride concentrations to below its MCL of 2 (ug/l. Since the treatment system results in the complete destruction of contaminants, there are no air emissions.

The ground water treatment plant is operated continuously to vary the local ground-water flow pattern. This results in containment of the ground-water contaminant plume within the boundaries of OU 4. In addition, this type of operation may reduce the overall remediation time while ensuring compliance with the ground-water ARARs as previously discussed for the original ROD remedy.

4.2 REMEDIAL ACTION OBJECTIVES

The remedial action objectives (RAOs) for soil at OU 4 as presented in the Final Remedial Investigation /Feasibility Study for Operable Unit 4 (JMM, 1991) include the following:

(1) prevent contaminant migration from the soil into the shallow ground-water system that could result in contaminant concentrations the exceed the remedial action objectives for ground water,
(2) prevent direct human contact with contaminated soil,
(3) remediate or remove soils to achieve an excess cancer risk of 10-4 to 10-6,
(4) meet ARARs, and
(5) remove the water purification tablets

The amended remedy includes soil excavation and off-site disposal, therefore the above referenced RAOs are achieved. Since the OU 4 Hotspot did not contain water purification tablets, this RAO is not applicable. The containment of soils under the buildings satisfies the RAO's since it prevents the migration of contaminants from soil to ground water by preventing the introduction of fluids into the subsurface. The presence of the concrete floor slabs also prevents direct human contact with the contaminated soils left in place under the buildings. Although the soils will not be removed, the excess cancer risk of 10-6 will be met by elimination of direct contact.

The RAO's for ground water at OU 4 include the following:

(1) prevent accidental ingestion and dermal contact with ground water containing carcinogens and non-carcinogens in excess of chemical-specific ARARs
(2) remediate ground water to achieve an excess cancer risk of 10-4 to 10-6,
(3) ensure that contaminant concentrations avoid chronic health effects.

The extraction trench included in the amended remedy has been designed to cut off the ground-water contaminant plume at the depot boundary, thus preventing accidental ingestion and dermal contact with the contaminated ground water by off-depot personnel. The ozonation system results in the complete destruction of organic contaminants, thereby achieving an excess cancer risk of less than 10-6 and ensuring that chronic health effects are avoided.

5.0 EVALUATION OF ALTERNATIVES

5.1 SUMMARY OF OU 4 HOTSPOT REMEDY

The selected remedy for the OU 4 Hotspot includes:

- Excavation of contaminated soils within the Oil Pit and Former Disposal Trenches A and B, and offsite landfill disposal of the excavated soils are consistent with the OU 4 ROD. Due to the presence of the Building 359 (15C) and 367 (16C), an unknown volume of contaminated soil was left in place. Since the buildings are in excellent condition and have been in continuous use, the soils are considered to be effectively contained under the buildings. The locations of the Oil Pit and the Former Disposal Trenches are presented in Figure 2.

- Treatment of contaminated saturated zone soils in-situ through enhanced biodegradation using an Oxygen Releasing Compound system (ORC™) to stimulate native soil biomass and enhance biodegradation of contaminants in the saturated zone remaining beneath Building 16C and below excavated areas in the OU 4 Hotspot source area.

- Extraction of the Hotspot plume using a 300 foot long extraction trench, extending to a depth to tie into the underlying clay layer to capture the plume defined by the 2 jig/ 1 vinyl chloride contour. The extraction trench will be located downgradient of the plume along the western DDHU property boundary. Extracted ground water is treated by an advanced oxidation process using ozone and hydrogen peroxide. Treated ground water is conveyed to a nearby sewer manhole for disposal. The location of the OU 4 OU 4 Hotspot treatment system is presented in Figure 3.

- The selected remedy for the OU 4 Hotspot also involves the use of institutional controls. At the time of property transfer, the institutional controls will take the form of land use restriction. The land use restrictions are protective of human health and environment by:

    1. Restricting the property for commercial and industrial use only.
    2. Not permitting access for use of the ground water underlying the property without the written approval of the DLA, EPA, and UDEQ.
    3. Ensuring that future users of the property do not tamper, damage, or impede the ground water treatment or monitoring systems.
    4. Not permitting excavation, digging, or disturbance of the soil beneath the foundations of Buildings 359 (15C) and 367 (16C) without written approval of the DLA, EPA, and UDEQ.
    5. Restricting the disturbance of foundation elements for Buildings 359 and 367 which would result in direct human contact with the underlying soils without written approval of the DLA, EPA, and UDEQ.
    6. Placement of warning signs within Building 359 and 367 and within any future buildings constructed on the Building 359 and 367 sites stating, "No Excavation Beneath the Building Foundation without Prior Approval".

In addition to the above modifications to the original ROD remedy, this ROD Amendment makes several additions to the original ROD to allow for remediation of the OU 4 Hotspot within the OU 4 ROD. To the extent that this ROD-Amendment differs from the ROD, it supersedes the ROD. The changes are described as follows:

1. The ground-water effluent discharge point is modified to include discharge of treated ground water to a publicly- owned treatment works.

2. The alternate discharge point dictates revised treatment standards, so the treatment goals for remediation of the OU 4 Hotspot plume are the ground-water treatment criteria shown in Table 5. The point of compliance for ground-water

remediation remains defined by the 2 ug/l contour for vinyl chloride and ground-water cleanup goals for OU4 remain at MCLs.

TABLE 5
OU 4 HOTSPOT GROUND-WATER TREATMENT CRITERIA
(from Final Operable Unit 4 Hotspot Ground-water Remediation System, June 1997)

Chemical	Discharge Limit
Benzene	a
Total DCE	a
cis-l, 2-DCE	a
Tetrachloroethene (PCE)	a
Trichloroethene (TCE)	a
Vinyl chloride	a
pH (units)	6.0 to 9.0

a. Total Toxic Organics limit of 100 ug/l under the Central Weber Sewer Improvements district industrial discharge permit. Total Toxic Organics represent the summation of concentrations for all organic priority pollutants in a full scan.

3. Air emissions requirements are revised to include emissions from the advanced oxidation unit. Residual ozone (ozone not utilized in the oxidation process) shall be destroyed within the treatment system. A dual-bed catalyst with adsorber for hydrochloric acid neutralization, and discharge stack will be used to destroy excess ozone and discharge innocuous emissions.

4. Soil clean up goals specific to the contaminants found in the OU 4 Hotspot area were developed following risk assessment of the findings of investigative work in the source area. Table 6 summarizes soil clean up goals for the OU 4 Hotspot source area. Dioxins and furans were not found to pose a risk relative to the OU 4 Hotspot contamination, and are therefore not included in OU 4 Hotspot source area soil remediation criteria.

TABLE 6
OU 4 HOTSPOT SOURCE AREA SOIL REMEDIATION CRITERIA
(from Final Operable Unit 4 Hotspot Investigation and Alternatives Analysis Report Source Area Addendum, December 1997)

Chemical	Concentration (mg/kg)
Vinyl chloride	3.2
Lead - Disposal Trench A	1,850a
Diesel - Disposal Trench A	5,000 b
Oil and Grease - Disposal Trench A	10,000b

a. Based on USEPA Adult lead level model (EPA, 1996)
b. UDEQ Guidelines for Utah Tier 1 Risk-based corrective action.

5. Costs for remediating the OU4 Hotspot were not originally anticipated in the ROD. Actual costs for OU 4 Hotspot remediation are $3,500,000 for OU 4 Hotspot soils and $1,762,000 for the OU 4 Hotspot ground-water plume, and are additive to the overall OU 4 remediation costs. Operation and maintenance costs for the ground-water treatment system are projected at $100,000 per year for treatment of the OU 4 Hotspot groundwater plume.

5.2 EVALUATION OF REMEDY

Per EPA guidance, the components of the OU 4 Hotspot remedy that were not included in the original OU 4 ROD remedy need to be compared using the nine criteria. The nine evaluation

criteria address the technical and policy considerations that have proven important for selecting among remedial alternatives. The nine criteria include the following:

- Overall protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Implementability
- Cost
- State acceptance
- Community acceptance

The following paragraphs discuss each of the nine criteria in turn.

Overall Protection of Human Health and the Environment. The selected remedy is protective of human health and the environment by removing the majority of the source of vinyl chloride and petroleum hydrocarbons observed in ground water within the OU 4 Hotspot. In addition, containment of contaminated soils under the buildings is protective by preventing fluids from entering the subsurface and mobilizing contaminants. The buildings also provide an effective barrier thereby preventing human contact with the contaminated soils left in place. The implementation of the ground-water remedy is protective by removing contaminated ground water and providing for the destruction of ground-water contaminants.

Compliance with ARARs. As discussed in Tables 3 and 4, the remedies comply with the ARARs. Specifically, excavated soils will be handled, transported and disposed of in accordance with RCRA regulations. The soils contained under the building will comply with Federal and State Closure and Post- closure standards by minimizing and controlling contact with the contaminated soils present under the buildings and providing a means for the detection and containment of the soils by leaving and maintaining the concrete slabs. It is expected that the ground water remedy will comply with the ground-water ARARs. The treatment process results in the complete destruction of contaminants in the ground water. The treatment plant does not produce emissions of organic compounds thereby complying with Federal and State air quality regulations.

Long-term Effectiveness and Permanence. The removal of vinyl chloride during ground-water remediation will result in long-term effectiveness and permanence being achieved for ground water within the OU 4 Hotspot. The long-term effectiveness of the soil remedy is dependent upon the continued implementation of institutional controls and maintenance of the concrete building floors to prevent disturbance of the soils under the building and introduction of fluids into the subsurface.

Reduction of Mobility, Toxicity, and Volume Through Treatment. The containment of contaminated soils removes the potential for them to act as a continuing source of ground-water contamination thereby reducing mobility. Removal of soils from the source area reduces the volume of contaminated soil. The soil remedy does affect the toxicity of contaminants in source area soils. Compliance with the MCLs for groundwater contaminants results in the reduction of volume, mobility, and toxicity of contaminated ground water within the OU 4 Hotspot.

Short-term Effectiveness. The only short-term risks associated with this remedy are the potential for worker exposure to contaminated soil and ground water during excavation of the source area and construction of the extraction trench. These risks can be minimized using appropriate procedures and standard protective equipment.

Implementability. The implementation of the remedy is considered technically implementable.

Costs. The costs associated with the implementation of the remedy are detailed in Tables 3 and 4.

State Acceptance. Based on discussions with the State of. Utah during the development of the EE/CA, the State will accept the soil and ground water remedy for the OU 4 Hotspot.

Community Acceptance. It is expected that the community will accept the remedy since the ground water remedy is more protective than the original ROD remedy in that it provides for the complete destruction of contaminants. It is also expected that the soil remedy will be accepted since the portions of the remedy that do not deal with on-site containment are consistent with the original OU 4 ROD. It is expected that the community will accept the containment of contaminated soils under the buildings since the remedy provides provisions to eliminate accidental contact with the contaminated soils and limits the possibility for additional mobilization of soil contaminants to ground water.

In summary, the changes introduced by this ROD Amendment incorporate remediation of the OU 4 Hotspot source area and associated ground-water contaminant plume. As a part of this remedy, DDHU will amend the existing monitoring program to assess whether contaminant concentrations are decreasing over time and/or clean up levels are being attained within the OU 4 Hotspot ground water and saturated soils within the source area. DDHU has included design concepts of the OU 4 Hotspot remedy for ground water and soils in Final Operable Unit 4 Hotspot Ground-water Remediation System (Montgomery Watson, 1997b) and *Final Operable Unit 4 Hotspot Investigation and Alternatives Analysis Report Source Area Addendum (Montgomery Watson, 1997c*) respectively.

6.0 SUPPORT AGENCY COMMENTS

Comments received from Mr. Muhammad Slam of UDEQ are listed and addressed W1 below:

1. Page 41 under location-specific requirements. Remove the words "Since the OU 4 Hotspot is located within an industrial setting: from the second sentence and begin the sentence with There are no..."

   DDHU RESPONSE - This edit has been made as requested.

2. Page 41 under Chemical-Specific Requirements, in the third sentence after contaminated ground water that is not used, drop the words "is not" and replace with "ground water that could potentially be used for drinking."

   DDHU RESPONSE - This edit has been made as requested.

3. In the same section in the 5th sentence, the words "land disposal" are repeated twice.

   DDHU RESPONSE - The extra occurrence of the words "land disposal" have been deleted.

4. On page 42 under Action-Specific Requirements, 2nd sentence, change the word relevant to pertinent.

   DDHU RESPONSE - This edit has been made as requested.

5. This section [page 42, Action-Specific Requirements] needs to be beefed up. After the words Action Cleanup Standards policy in the last sentence we should site the regulation as being from the UST and CERCLA site requirements found in UAC R311-211. We should also address the Clean Air act and site requirements. Same is true of the clean Water Act that is found in 40 CFR Part 403 that allows us to discharge to A POTW that sets the action and pre treatment standards. A copy of the information to be included is attached.

DDHU RESPONSE - The section has been rewritten and now includes a reference to Appendix A summarizing the State Chemical- Specific ARARs.

6. We need to add two additional discussion items to the end of the ROD amendment. They are a discussion on the cost effectiveness and the utilization of a permanent solution and alternate treatment technologies or resource recovery technologies to the maximum extent possible.

DDHU RESPONSE - These two discussion items have been added to section 7.0.

No other comments from UDEQ or the USEPA were received during the public comment period.

7.0 STATUTORY DETERMINATIONS

The selected remedy for the DDHU OU 4 Hotspot meets the statutory requirements of Section 121 of CERCLA as amended by SARA. These statutory requirements include protection of human health and the environment, compliance with ARARs, cost effectiveness, utilization of permanent solutions and alternative treatment technologies to the maximum extent practicable. The following discussion presents how the selected remedy meets each of these requirements.

Protection of Human Health and the Environment

The selected remedy for the OU 4 Hotspot protects human health and the environment through the following controls:

- Excavation and off-site disposal of the majority of the OU 4 Hotspot source area soils to comply with the cleanup criteria listed in Table 6.

- Providing institutional controls (i.e. warning signs, notices to deed, and restrictive covenants) minimizes the accidental contact with the contaminated soils contained under the buildings.

- Extraction and treatment of groundwater from the OU 4 Hotspot ground-water contaminant plume until contaminant concentrations are below their MCLs, and total excess cancer risks are less than 10-4.

Removal and containment of the soil in the OU 4 Hotspot source area will eliminate the source of organic contamination in the ground water and remove the potential for exposure to these contaminants in soil. Treatment of contaminated ground water at the OU 4 Hotspot to levels below the MCLs will result in a reduction in the cancer risk to potential future ground-water users. The selected remedy for soil and ground water will not pose an unacceptable short-term risk to human health, the environment, nor will the site present any unacceptable risks after completion of the remedy.

Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d)(l) of CERCLA as amended by SARA, requires that remedial action must attain a degree of cleanup which assures protection of human health and the environment. In addition, remedial actions that leave any hazardous substances, pollutants, or contaminants on site must, upon completion, meet a level or standard which at least attains legally applicable or relevant and appropriate standards, requirements, limitations, or criteria. For further discussions on determining compliance with ARARs can be found in the OU 4 ROD.

Chemical-Specific Requirements. Chemical-specific ARARs set health-or risk-based concentration limits in various environmental media. Ground-water quality ARARs for the OU 4 Hotspot are based on the Safe Drinking Water Act maximum contaminant level (MCL). MCLs

are generally relevant and appropriate as cleanup standards for contaminated ground water that could potentially be used for drinking. Since the OU 4 Hotspot treatment process results in the complete destruction of contaminants, this ARAR is satisfied. Applicable requirements for OU 4 Hotspot soils include RCRA land disposal restrictions, the Solid Waste Disposal Act, the Occupational Safety and Health Administration (OSHA) regulations, and the Department of Transportation (DOT) hazardous material transportation regulations. Materials removed from the site were transported in accordance with the applicable regulations and disposed of in a RCRA permitted disposal facility.

Location-Specific Requirements. Location-specific ARARs set restrictions on the remediation activities, depending on the location of a site or its immediate environs. There are no location-specific ARARs associated with the selected remedy for the OU 4 Hotspot.

Action-Specific Requirements. Performance, design, or other action-specific requirements set controls or restrictions on certain kinds of remedial activities related to management of hazardous substances, pollutants, and contaminants. Federal action-specific ARARs that are pertinent to the remedial actions at the OU 4 Hotspot include RCRA Land Disposal and Closure Regulations, the Solid Waste Disposal Act, and the Occupational Safety and Health Act. State requirements include the following:

- Utah Corrective Action Cleanup Standards Policy for UST and CERCLA Sites (UAC R311-211) for general criteria to be considered in establishing cleanup standards.
- Utah Air Conservation Regulations (UAC R301-1-3; R307-1-4; R307-10; R307-12; R307-14) for air quality and emissions standards.
- Utah Ground Water Quality Protection Rule for numerical cleanup levels and other performance standards for contaminated ground water.
- Clean Water Act (40 CFR Part 403) for action and pretreatment requirements when discharging to a POTW.

A summary of all federal and state ARARs is presented in Appendix A.

Preference for Treatment as a Principal Element

The selected remedy does not use treatment for remediating soils. However, this is consistent with the original OU 4 ROD and is not considered an obstacle for regulatory acceptance of the remedy. The remedy for soil does not result in a reduction of toxicity or volume, however, the mobility of contaminants is controlled through placement in a RCRA regulated landfill facility. The selected remedy for OU 4 Hotspot ground water does employ treatment as a principal element for remediation of contaminated ground water. Ground water is treated through an ozone/peroxide system which results in the complete destruction of ground water contaminants. The ozone/peroxide system results in a reduction of the volume and toxicity of contaminants by reducing contaminants to harmless by-products.

Cost Effectiveness

Overall cost-effectiveness can be defined as the reduction in threat to human health and the environment per dollars expended on a remedy. The selected remedy for contaminated soils (excavation with landfill disposal and containment under building) at the DDHU OU 4 is the most cost-effective alternative because it provides the maximum effectiveness proportional to cost of any of the alternatives analyzed. Although the cost of the selected remedy is within the accuracy range of the bioventing alternative and more expensive than the "no-action" alternative, the long-term risk associated with contamination mobility and the potential inability to fully remediate the vinyl chloride is significantly lower for this alternative than for the other two. Similarly, although all ground-water treatment alternatives are comparable in cost, the selected remedy (extraction trench with ozonation and POTW discharge) provides the best value because it results in the complete destruction of contaminants instead of merely transferring them into another medium (i.e. air).

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

This section briefly describes the rationale for the selected remedy and explains how the remedy provides the best balance of tradeoffs among all the alternatives.

EPA, the State of Utah, and the DDHU have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost effective manner for the final source control and ground-water remediation at OU 4. The remedy to address the soil contamination was selected because it provided a higher degree if protectiveness than the no-action and bioventing alternatives, which allow contaminated soils to remain in place and do not mitigate the risk associated with contaminant migration to ground water. The alternative to excavate and dispose of soils off-site was chosen over the on- site composting option because it was comparable in cost but allowed the RAOs to be met sooner and eliminated the uncertainty associated with remediating vinyl chloride.

The remedy to address the ground-water contamination (extraction, ozonation, and discharge to a POTW) was selected because it was similar in cost to the other alternatives but allowed for actual destruction of the contaminants, as opposed to transferring them from one media (water) to another (air).

Considering the new information that has been developed and the changes introduced to the original remedy, EPA, Utah DEQ, and DDHU believe that the remedy remains protective of human health and the environment, complies with federal and state requirements, and were identified in the ROD as applicable and relevant or appropriate to this remedial action. In addition, the revised remedy uses permanent solutions and alternative treatment technologies to the maximum extent practical for this site.

DDHU

21 July 00
Date

U.S. EPA

8/7/00
Date

Utah DEQ

9/7/00
Date

8.0 PUBLIC PARTICIPATION COMPLIANCE AND RESPONSIVENESS SUMMARY

This responsiveness summary serves two purposes: first, it provides regulators with information about the views of the community with regard to the proposed remedial action for DDHU Operable Unit 4. Second, it documents how public comments have been considered during the decision- making process and provides a response to each comment submitted by the public.

DDHU has presented this change to remedy in the form of a ROD Amendment because the change is of a fundamental nature. DDHU provided the EPA and Utah DEQ with a comment period on this ROD-Amendment in accordance with Section 117(c) of CERCLA. DDHU published a notice in a local newspaper which described this ROD Amendment and its availability for review at the DDHU repository. The notice included a Request for Comments regarding the amendment to the ROD seeking public comments on the actions described by this ROD Amendment. Additionally, a public meeting was held at Building 1 - Command Briefing Room, 375 Ward Avenue, Ogden, Utah, on May 16, 2000. This ROD Amendment and all documents that support the change herein are contained in the administrative record for the DDHU site.

No comments were received during the public meeting, and comments from only one author were received during the Public Comment Period. These comments, from Mr. Delbert P. Williams, were addressed in a response letter (May 19, 2000) to Mr. Williams by Lieutenant Colonel Charles W. Gore. Excerpts from this letter appear below each comment. Copies of the original public comments and the response letter are included in Appendix B.

1. [Please forward me] a chart of just which areas of the (DDOU) property the need clean up soil is located [sic].

   DDHU RESPONSE - A map detailing the source areas was sent as an attachment to the letter.

2. What is there in this soil that will require, the cleanup; and costly Alternatives to the United States Government, and to your attention [sic]?

   DDHU RESPONSE - The soil remediated at trench A and B contained lead. The soil remediated at the former Oil Pit contained vinyl chloride, total petroleum hydrocarbons (TePH), diesel fuel, oil and grease. A cleanup level for each of the contaminants was established which would be protective of the environment and personnel working in the area. DDOU coordinated the site remediation with the Utah Department of Environmental Quality (UDEQ) and the US Environmental Protection Agency (EPA). A copy of the Workplan and Remedial Action Report for the site are available at the former DDOU in Building 1 if you wish additional details.

3. Why was this work not accomplish [sic] before the sale of said land to Ogden City Utah?

   DDHU RESPONSE - In 1992, the Agency for Toxic Substances and Disease Registry (ASTDR) performed a Public Health Assessment of the Defense Depot Ogden. The Health Assessment must be finalized prior to the EPA and UDEQ approving the transfer. The transfer of this property to the City of Ogden is expected to occur in December 2000.

   In reply to your final question, the property has not yet transferred to the City of Ogden. The site remediation by DDHU is required prior to the transfer of the property. The ROD Amendment must be finalized prior to EPA and the UDEQ approving the transfer.

9.0 REFERENCES

Defense Logistics Agency (DLA), 1992. Final Record of Decision and Responsiveness Summary for Operable Unit 4, September 1992.

Montgomery Watson, 1996. Revised Final Investigation and Alternative Analysis Report, March 1996.

Montgomery Watson, 1997a. Final Operable Unit 4 Hotspot Design Concept for the OU4 Hotspot Ground- water Remediation System, June 1997.

Montgomery Watson, 1997b. Final OU4 Hotspot Exploration Trench Report, April 1997.

Montgomery Watson, 1997c. Final Operable Unit 4 Hotspot Investigation and Alternatives Analysis Report, Source Area Addendum (December 1997).

U. S. Environmental Protection Agency (EPA) (1991), Guide to Addressing Pre-ROD and Post-ROD Changes, Office of Solid Waste and Emergency Response, Publication 9355.3-02.

U. S. Environmental Protection Agency (EPA) (1993), Guidance on Conduction Non-Time Critical Removal Actions Under CERCLA, Office of Emergency and Remedial Response, Publication 9360.0-32.

U. S. Environmental Protection Agency (EPA) (1996), Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996.

APPENDIX A

SUMMARY TABLES OF STATE AND FEDERAL ARARs

TABLE A-1 Identification of Federal Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Solid Waste Disposal Act	42 USC Sec. 6901-6987			
	40 CFR Part 261			
Identification and Listing of Hazardous Waste		Defines those solid wastes which are subject to regulation as hazardous wastes under 40 CFR Parts 262-265, 268, and Parts 270, 271, 124.	No/Yes	Identifies wastes that are subject to land disposal restrictions under 40 CFR 268.
Safe Drinking Water Act	42 USC Sec. 300g			
	40 CFR Part 141	Establishes health-based standards for public water systems (maximum contaminant levels).	No/Yes	Remedial Action Objectives: Vinyl Chloride – 2 µg/L Benzene – 5 µg/L cis-1,2-DCE – 70 µg/L PCBs – 0.5 µg/L TCE – 5 µg/L
National Primary Drinking Water Regulations Implementation	40 CFR Part 142	Establishes regulations for the implementation and enforcement of 40 CFR Part 141	No/Yes	Provides regulatory requirements for exemptions and variance from MCLs for synthetic organic chemicals (40 CFR Part 142.62)

TABLE A-1 Identification of Federal Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Safe Drinking Water Act (continued)				
National Secondary Drinking Water Standards	40 CFR Part 143	Establishes welfare-based standards for public water systems (secondary maximum contaminant levels).	No/No	Ground water will not be used as a public water system. These criteria are set primarily for aesthetic and taste purposes.
Maximum Contaminant Level Goals	Pub. L. No. 99-339, 100 Stat. 642 (1986)	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety.	No/Yes	Relevant and appropriate for contaminants in ground water at OU 4.
Clean Water Act	33 USC Sec. 1251-1376			
Water Quality Criteria	40 CFR Part 131 Quality Criteria for Water, 1986	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	No/Yes	Relevant and appropriate to ground water treatment at OU 4.

TABLE A-1 Identification of Federal Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Clean Air Act	42 USC Sec. 7401-7642			
National Primary and Secondary Ambient Air Quality Standards	40 CFR Part 50	Establishes standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).	No/Yes	Relevant and appropriate to any on-site activity which might result in air emissions during remedial actions at OU 4.
National Emission Standards for Hazardous Pollutants	40 CFR Part 61	Sets emission standards for designate hazardous pollutants	No/Yes	Relevant and appropriate to ground water treatment, facility air emissions of vinyl chloride.
Occupational Safety and Health Act	20 USC Sec. 651-678	Regulates worker health and safety	Yes/--	Applicable to any remedial action activity.
D.O.T. Hazardous Material Transportation Regulations	49 CFR Parts 107, 171-177	Regulates transportation of hazardous materials	Yes/--	Applicable to remedial actions involving off-Depot movement of hazardous materials during remediation.

TABLE A-1 Identification of Federal Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Resource Conservation and Recovery Act	Section 3004(m)	Waives prohibition of land disposal of a particular hazardous waste if levels or methods of treatment substantially reduce toxicity or likelihood of migration of hazardous constituents to minimize short and long term threats to human health and the environment.	No/Yes	Appropriate for remedial alternatives involving landfilling of contaminated soil.

TABLE A-2 Identification of State Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Utah Public Drinking Water Regulations	UAC R309-103-2	Establishes maximum contaminant levels for inorganic and organic chemicals	No/Yes	Requirements are relevant and appropriate to OU 4. Some MCLs established for contaminants not federally regulated; e.g., total dissolved solids
Utah Public Drinking Water Regulations – Secondary Standards	UAC R309-103-3	Establishes welfare-based standards for public water systems (secondary maximum contaminant levels).	No/Yes	May be relevant and appropriate for inorganics such as iron.
Utah Ground Water Quality Protection Regulations	UAC R317	Establishes ground water quality standards for the different ground water aquifer classes.	--/--	The Utah Ground Water Quality Protection Rule establishes numerical cleanup levels and other performance standards for contaminated ground water. Although no determination has been made concerning whether this rule is an applicable or relevant and appropriate standard at OU 4, the standards required by the Ground Water Quality Protection Rule will be met by complying with drinking water MCLs.

TABLE A-2 Identification of State Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Division of Solid and Hazardous Waste, Department of Environmental Quality	UAC R315-8-6	Ground water protection standards for owners and operators of hazardous waste TSDFs	Yes/Yes	Establishes ground water protection standards for hazardous waste TSDFs. Standards include ground water monitoring requirements and maximum concentrations of hazardous constituents allowable before corrective action must be implemented.
Cleanup and Risk-Based Closure Standards	UAC R315-101	Establishes risk-based closure and corrective action requirements. Requires removal or control of sourcee.	Yes/-	This rule is applicable for remedial activities, including site management, corrective action, and closure. The rule references MCLs defined in UAC R315-8-6.
	UAC R315-2	Criteria for the identification and listing of hazardous waste.	Yes/--	Definition of hazardous waste mirrors federal definition. If wastes generated during the remediation phase are determined to contains hazardous constituents, they will be subject to these requirements.

TABLE A-2 Identification of State Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Corrective Action Cleanup Standards Policy –UST and CERCLA Sites	UAC R311-211	Lists general criteria to be considered in establishing cleanup standards including compliance with MCLs in Safe Drinking Water Act and Clean Air Act.	--/Yes	This requirement is not applicable because federal CERCLA sites are remediated under CERCLA and the NCP. It is, however, relevant and appropriate. Requires action to be taken to be protective. Requires source removal or control of source and prevention of further degradation. The State of Utah maintains that UAC R311-211 is "applicable".
Division of Water Quality, Department of Environmental Quality	UAC317-2	Standards for quality for waters of the state.	Yes/--	Applicable to discharges to surface water. These rules are specific to Utah surface waters, though they are derived in part by using the federal criteria. May be relevant and appropriate where ground water is a potential water supply if other standards are not available. See particularly the anti-degradation policy of UAC R317-2-3.

TABLE A-2 Identification of State Chemical-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Utah Air Conservation Regulations	UAC R307-201 and -214	Emission standards.	Yes/--	National Emission Standards for Hazardous Air Pollutants (NESHAP) are incorporated by reference (see 40 CFR 61 Subpart A).
	UAC R307-205	Fugitive emissions and fugitive dust.	Yes/--	Requires use of mitigative measures such as dust suppressants and foams if necessary.

TABLE A-3 Identification of Federal Action-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Solid Waste Disposal Act	42 USC Sec. 6901-6987			
Guidelines for the Land Disposal of Solid Wastes	40 CFR Part 241	Establishes requirements and procedures for land disposal of solid wastes.	Yes/--	Applicable to remedial alternatives involving landfill storage of non-hazardous contaminated soils or debris such as water purification tablets. Not applicable or relevant and appropriate for hazardous soils.
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment.	Yes/--	Applicable to remedial alternatives involving off-site landfilling of contaminated soils.
Standards Applicable to Generators of Hazardous Waste	40 CFR Part 262	Establishes standards for generators of hazardous waste.	Yes/--	Applicable to remedial alternatives involving landfilling of hazardous contaminated soils and debris. Not applicable to landfilling of hazardous soils.

TABLE A-3 Identification of Federal Action-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the U.S. if the transportation requires a manifest under 40 CFR Part 262.	Yes/--	Transport of hazardous material off-site may occur during some remedial alternatives.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste.	Yes/Yes	See discussion of specific subparts.
• General Facility Standards	Subpart B		Yes/--	Applicable to off-site landfills.
• Preparedness and Prevention	Subpart C		Yes/--	Applicable to off-site landfills
• Contingency Plan and Emergency Procedures	Subpart D		Yes/--	Applicable to off-site landfills

TABLE A-3 Identification of Federal Action-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
• Manifest System Record Keeping and Reporting	Subpart E		Yes/--	Applicable to alternatives involving GAC media management and disposal, and off-site landfill.
• Releases from Solid Waste Management Units	Subpart F		Yes/--	Applicable to off-site landfills.
• Closure and Post-Closure	Subpart G		Yes/--	Applicable to off-site landfills.
• Financial Requirements	Subpart H		Yes/--	Applicable to off-site landfills.
• Use and Management of Containers	Subpart I		Yes/--	Applicable to off-site landfills.
• Waste Piles	Subpart L		No/Yes	Relevant and appropriate to materials handling operations on site.
• Landfills	Subpart N		Yes/--	Applicable to off-site landfills.
• Incinerators	Subpart O		Yes/--	Applicable to off-site incineration if necessary for treatment of some soils.

TABLE A-3 Identification of Federal Action-Specific ARARs

Standard Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	40 CFR Part 267	Establishes minimum national standards that define acceptable management of hazardous waste for new land disposal facilities.	No/Yes	Remedies should be consistent with the more stringent Part 264 standards as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Land Disposal Restrictions	40 CFR Part 268	Identifies hazardous wastes that are restricted from land disposal.	Yes/Yes	Applicable to soils containing F001-F-005 solvents disposed of off-site. Relevant and appropriate for on-site disposal activities.
Safe Drinking Water Act	42 USC Sec. 300g			
	40 CFR Part 136	Sets approved test methods for waste constituent monitoring.	No/Yes	Relevant and appropriate to ground water treatment.
Occupational Safety and Health Act	20 USC Sec. 651-678			
	29 CFR Part 1910	Regulates worker health and safety.	Yes/--	Applicable to all remedial activities.
D.O.T. Hazardous Material Transportation Regulations	49 CFR Parts 107, 171-177	Regulates transportation of hazardous materials	Yes/--	Applicable to off-site disposal of wastes.

APPENDIX B

PUBLIC COMMENTS AND RESPONSE LETTER

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MAY - 9 2000

Environmental Protection Agency.
Regional Office.
999 18th ST.
Denver, CO.

Mr. Delbert P. Williams
4005 W. 1975 N.
Ogden, UT 84404-9036

4 May 2000

Dear: Ms Judith McCulley:

REFERENCE: PUBLIC NOTICE of 1 MAY 2000 in the STANDARD-EXAMINER

That (DDHU) is conduction a public comment period on the Alternative for the Cleanup of Soil at the formerly know (DDOU).

I have been unable to make communicate with Mr Smith, here at the Ogden, Utah, Office, in regards to this public hearing, being held 16 May 2000; the Clean up of soil in Unit # 4 (HOTSPOT), on the old (DDOU), property in Ogden, Utah.

I will be out of state for the next week. This is my reason for asking if you could please forward me the following information.

1. A chart of just which areas of the (DDOU) property the need clean up soil is located ?
2. What is there in this soil that will require, the cleanup; and costly Alternatives to the United States Government, and to your attention?
3. Why was this work not accomplish before the sale of said land to Ogden City, Utah!

I know for a fact that at times in the past; Muster Gas, and Methyl bromide was disposed in the vicinity where Four-mile Creek, Mill stream, and the old Plain City Irrigation Canal confluence, that this area it was used as a burn pit. The water coming through, and under the DDOU land; "this water must pass through, and is used for Farming the land out west "here in (Plain city, Warren, and Reese).

We are also have a death by Cancer in about one third of home in these small Farming Community.

THANK YOU :

Delbert P. Williams

Delbert P. Williams
4005 W 1975 North
Plain City, Utah
84404
(801) 731 1338

DEFENSE LOGISTICS AGENCY
DEFENSE DISTRIBUTION DEPOT HILL
5851 F AVENUE, BUILDING 849
HILL AIR FORCE BASE, UT 84056-5713

MAY 19 2000

DDHU-D

TO: Mr. Delbert P. Williams
4005 W. 1975 N.
Plain City, UT
84404

Dear Mr. Williams:

I am writing this letter in coordination with Ms. Judith McCulley from Region VIII of the Environmental Protection Agency (EPA) in reply to questions in your May 4 letter to Ms. McCulley. The questions are related to the comment period for the Record of Decision (ROD) Amendment for Operable Unit 4. This response and your letter will become part of the record for the public comment period. A copy of the letter is attached.

In 1995, the Defense Distribution Ogden, Utah (DDOU) was included in the Base Realignment and Closure (BRAC) list for closure. The Depot was officially closed in 1997 with interim property management transferred to the Defense Distribution Depot Hill, Utah (DDHU). DDHU is part of the Defense Logistics Agency's Defense Distribution Center.

In 1996, it was learned that five former disposal trenches were located in the area of Buildings 15C and 16C on the former DDOU. Research revealed that these trenches were in use until the buildings were constructed in 1951. A diagram is attached showing where the contaminated soil discussed in the Amendment was located. The soil was located between and beneath Buildings 15C and 16C in disposal trenches A, B and the former oil pit. No soil contamination that required cleanup was found in C, D and E. The contaminated soil located between the Buildings was excavated and transported off site to a permitted facility.

The soil remediated at trench A and B contained lead. The soil remediated at the former Oil Pit contained vinyl chloride, total petroleum hydrocarbons (TePH), diesel fuel, oil and grease. A cleanup level for each of the contaminants was established which would be protective of the environment and personnel working in the area. DDOU coordinated the site remediation with the Utah Department of Environmental Quality (UDEQ) and the US Environmental Protection Agency (EPA).

A copy of the Workplan and Remedial Action Report for the site are available at the former DDOU in Building 1 if you wish additional details.

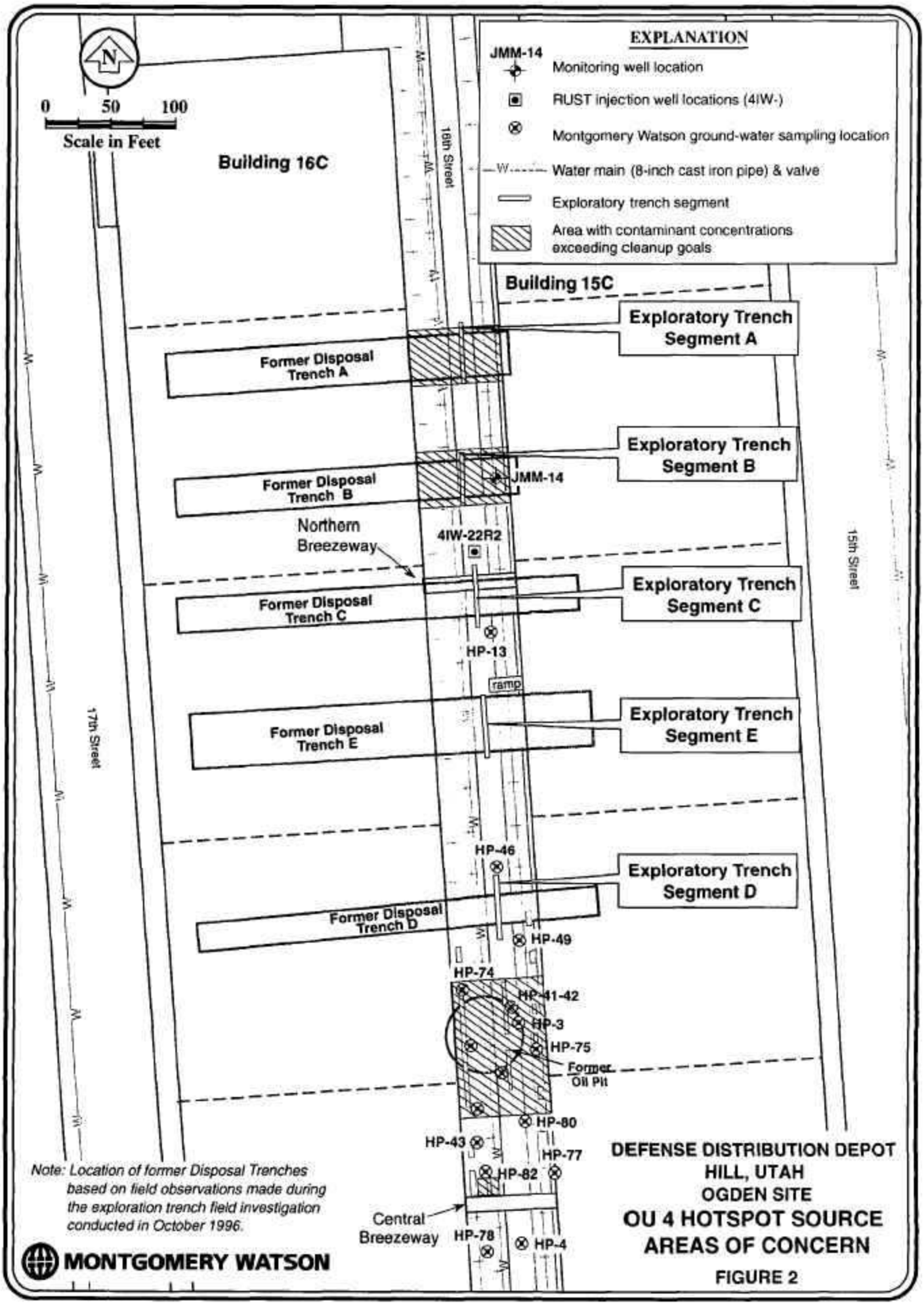
In 1992, the Agency for Toxic Substances and Disease Registry (ASTDR) performed a Public Health Assessment of the Defense Depot Ogden. The Health Assessment must be finalized prior to the EPA and UDEQ approving the transfer. The transfer of this property to the City of Ogden is expected to occur in December 2000.

In reply to your final question the property has not yet transferred to the City of Ogden. The site remediation by DDHU is required prior to the transfer of the property. The ROD Amendment must be finalized prior to EPA and the UDEQ approving the transfer.

If you need any further information please contact Ronald Smith of my Environmental Office at (801) 399-7629 or Judith McCulley (EPA) at (303) 312-6667 or Muhammad Slam (UDEQ) at (801) 536-4100.

CHARLES W. GORE
Lieutenant Colonel, USA
Commander

Attachments



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